

PRIMARY ANSWERS

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N1a Place Value - Integers Answers

1) Put the following numbers in the place value table.

a)	2415	1000	100	10	1
b)	607	Thousands	Hundreds	Tens	Units
C)	9380	2	4	1	5
d)	2004		6	0	7
α)	2001	9	3	8	0
		2	0	0	4

- 2) Write the following numbers in figures.
 - a) six hundred and sixty seven 667
 - b) two thousand one hundred and fifty six 2156
 - c) nine hundred and fourteen 914
 - d) four thousand and seventy one 4071
- 3) Write the following numbers in words.
 - a) 5432 five thousand four hundred and thirty two
 - b) 811 eight hundred and eleven
 - c) 3620 three thousand six hundred and twenty
 - d) 9090 nine thousand and ninety
- 4) a) What is the value of the 2 in the number 1250? 200
 - b) What is the value of the 6 in the number 6924? 6000



Match the words with the correct numbers. 1)



Here are four number cards. 2) 4 6







a) What is the **biggest three digit** number you can make with these cards? 6

b) What is the **biggest even number** you can make with all four cards?

- a) Write a whole number that is bigger than 3) one thousand but smaller than one thousand one hundred. anything from 1001 to 1099
 - b) Write the number eleven thousand eleven hundred and eleven. 12111



- 1) Put the following numbers in the place value table:
 - a) 7.24
 - b) 30.036
 - c) 209.107
 - d) 5034.005

Thousands Hundreds Tens Units - Tenths Hundredths Thousandths

			7	•	2	4	
		3	0	•	0	3	6
	2	0	9	•	1	0	7
5	0	3	4	•	0	0	5

- 2) Write the following numbers in figures:
 - a) Eight point two four 8.24
 - b) Fifty point zero two five 50.025
 - c) Three hundred and six point two 306.2
 - d) Two thousand, five hundred and forty point zero seven 2540.07
- 3) Write the following numbers in words:
 - a) 7.5 Seven point five
 - b) 80.26 Eighty point two six
 - c) 930.074 Nine hundred and thirty point zero seven four
 - d) 1402.306 One thousand four hundred and two point three zero six
- 4) a) What is the value of the 4 in the number 72.46? Four tenths
 - b) What is the value of the 5 in the number 8.205? Five thousandths

N1C Place Value - Measures Answers



- 1) Use the place value table to convert
 - a) 2571 mm to cm 257.1 cm
 - b) 7 cm to mm 70 mm
 - c) 4 m to cm 400 cm
 - d) 324 mm to m 0.324 m
 - e) 8 cm to m 0.08 m



- 2) Use the place value table to convert
 - a) 4052 ml to L 4.052 L
 - b) 596 mL to L 0.596 L
 - c) 7 L to mL 7000 mL
 - d) 8.4 L to mL 8400 mL
 - e) 9.03 L to mL 9030 mL



The thermometers A to F show the temperature at 3:00 A.M. in six different cities.

Use them to fill in the table below.

The first one has been done for you.

Thermometer Temperature at 3.00 A.M		Temperature change over next five hours	Temperature at 8.00 A.M.	
А	-3 °C	rises 8 °C	5 °C	
В	5 °C	falls 6 °C	-1 °C	
С	-5 °C	rises 3 °C	-2 °C	
D	11 °C	falls 15 °C	-4 °C	
E	-1 °C	rises 8.5 °C	7.5 °C	
F	2 °C	falls 6.5 °C	-4.5 °C	



- 1) Place these numbers in order of size, smallest to largest.
 - a) -1, 2, 5, 6
 b) -5, -2, 3, 4, 7
 c) -4, -2, -1, 0, 3, 9
 d) -9, -6, -4, -3, 1, 4, 8
 e) -12, -10, -8, -7, -6, -4, -3
 f) -5.5, -4, -3.5, -3, -2.5, 6, 7.5, 8.5
- 2) a) What is special about the temperature 100 °C? Water boils
 - b) What is special about the temperature 0 °C? Water freezes



3) Place a counter on 0.
Player A and B take turns in rolling a dice.
Whatever scores player A gets, he/she always moves this many squares to the left.
Whatever scores player B gets, he/she always moves this many squares to the right.
Player A wins if he/she needs to move to a square which is less than -8.
Player B wins if he/she needs to move to a square which is more than 8.



- A- seven point four
- C- zero point four zero seven H- four seven four
- D- four seven point four I- four seven point zero
- E- seven point zero four
- F- seven zero four
- B- zero point forty seven G- forty seven point four

 - J- zero point four seven
- 2) Arrange the numbers in order of size, starting with the smallest.

1.8	0.8	8	8.1
0.8	1.8	8	<u>8.1</u>
0.08	1.16	0.12	1.09
<u>0.08</u>	<u>0.12</u>	<u>1.09</u>	<u>1.16</u>
	1.8 <u>0.8</u> 0.08 <u>0.08</u>	1.80.80.81.80.081.160.080.12	1.80.880.81.880.081.160.120.080.121.09

- c) £4.04 £4.40 £4.14 £0.41 $\underline{\pounds}0.41$ $\underline{\pounds}4.04$ $\underline{\pounds}4.14$ $\underline{\pounds}4.40$
- d) 3.11 3.1 3 3.011 3.001 <u>3</u> 3<u>.001</u> 3<u>.01</u>1 3.1 3.11
- e) 0.2 0.022 0.202 0.222 0.22 0<u>.02</u>2 0.2 0.202 0.22 0.222
- 6.06 60.06 6.606 66.06 6.066 f) 6<u>.066</u> 6<u>.606</u> 6<u>0.06</u> 6<u>6.06</u> 6.06



2) The times, in seconds, for the seven runners in a 100m race were:

9.96 10.03 9.92 10.26 10.37 9.99 10.00

What was the time of the winner? 9.92

3) I am a decimal number.

I have two figures before the decimal point and two figures after the decimal point.

I read the same forwards as backwards.

I have no zeros.

My first digit is bigger than my second digit. The sum of my digits is 8.

What number am I? 31.13

For each set of questions, time how long it takes to get the answers.

Adding Integers - Mentally

Answers

You must work out the answers in your head - you can't do any working on paper.

Set A

.

1)	23 + 35 = 58		Set B		
2)	17 + 13 = 30	1)	42 + 56 = 98		Set C
3)	45 + 46 = 91	2)	23 + 56 = 79	1)	$62 \pm 24 = 86$
4)	38 + 44 = 82	3)	37 + 25 <u>= 62</u>) 2)	$38 \pm 22 = 60$
5)	71 + 54 = 125	4)	68 + 26 <u>= 94</u>	2) 3)	30 + 22 = 00 17 + 34 = 51
6)	38 + 46 = 84	5)	83 + 65 = 148	3) 4)	52 + 29 - 81
7)	27 + 68 = 95	6)	59 + 37 = 96) 5)	82 + 63 - 145
8)	64 + 77 = 141	7)	42 + 39 = 81	6)	28 + 36 = 64
9)	64 + 99 = 163	8)	57 + 68 = <mark>125</mark>	(0) 7	20 + 00 = 04 88 + 17 = 105
0)	87 + 96 = 183	9)	99 + 48 = 147	7) 8)	67 + 56 - 123
		10)	68 + 94 = 162	9)	42 + 98 = 140
				5)	
				10)	78 + 93 = 171

For any set of questions:

45 seconds or less:	Maths teacher standard
46 to 89 seconds:	Extremely fast
90 to 149 seconds:	Fast
150 to 209 seconds:	Reasonable
210 seconds or more:	A bit more practise needed

Adding Integers - Mentally

Answers

How do you win every time?

You probably noticed that if you can get to 18 you definitely win.

But, if you get to 15 you can definitely get to 18 and so 15 is a step on the way to victory.

And if you get to 12 you can get to 15.

To cut a long story short, just stick to the 3 times table (or get on to it as soon as you can if you go first.)

So, if you go second, your numbers will always be: 3, 6, 9, 12, 15, 18, 21.

If you go first, start with a 1 or 2 and keep playing until you can say, 6, 9, 12, etc.

Adding Integers - Written Method N3b *Answers*

- 1) 51 + 36 = <u>87</u>
- 2) 41 + 27 = <u>68</u>
- 3) 231 + 25 = 256
- 4) 446 + 38 = 484
- 5) 569 + 84 = 653
- 6) 316 + 262 = <u>578</u>
- 7) 596 + 472 = $\frac{1068}{1000}$
- 8) $657 + 847 = \frac{1504}{1504}$
- 9) 62 + 38 + 517 = 617
- 10) 216 + 32 + 518 + 74 = 840

N.	Adding Integers 36 Ar	s - Written Method
1) 23 +4 5	2) 58 +26	Work out what the 🛠 must be.
68	84	
3) 79	4) 7 3	
+ 48	+ 8 7	
127	160	
5) 94	6) 2 6 6	
+ 98	+ 35 2	
192	618	
7) 4 <mark>8 7</mark>	8) 8 6 7	
+ 264	+ 4 9 6	
751	1363	

Subtracting Integers - Mentally

Answers

For each set of questions, time how long it takes to get the answers.

You must work out the answers in your head - you can't do any working on paper.

Set A

1) 75 - 71 = 4Set B 2) 98 - 93 = 51) 57 - 52 = 5Set C 3) 84 - 32 = 522) 78 - 71 = 71) 39 - 34 = 54) 68 - 24 = 443) 56 - 13 = 432) 67 - 62 = 55) 79 - 47 = 324) 78 - 27 = 513) 83 - 42 = 416) 38 - 29 = 966 – 31 **= 35** 5) 4) 88 - 34 = 547) 67 - 48 = 196) 84 - 38 = 4676 - 25 = 515) 8) 54 - 39 = 157) 76 - 29 = 476) 63 - 39 = 2494 - 36 = 589) 8) 43 - 17 = 2646 - 28 = 187) 72 - 25 = 4710) 62 - 26 = 369) 8) 54 - 48 = 651 - 24 = 2710) 9) 72 - 27 = 4572 - 38 = 3410)

For any set of questions:

45 seconds or less: Maths teacher standard
46 to 89 seconds: Extremely fast
90 to 149 seconds: Fast
150 to 209 seconds: Reasonable
210 seconds or more: A bit more practise needed

Subtracting Integers - Mentally

Answers

This trick works by itself.

On the piece of paper you must always write the number **1089**.

This number will always be the answer. Here are some examples to show you.

412	913	784
-214	-319	-487
198	594	297
+ 891	+ 495	+ 792
1089	1089	1089
543	978	310
-345	-879	-013
198	099	297
+ <u>891</u>	+ 990	+ 792
1089	1089	1089



- 1) 35 12 = 23
- 2) 58 27 = 31
- 3) 93 46 = <u>47</u>
- 4) 258 37 = 221
- 5) 681 79 = 602
- 6) 420 68 = 352
- 7) 743 471 = 272
- 8) 361 278 = <u>83</u>
- 9) 800 692 = 108
- 10) 1450 785 = 665

Subtracting Integers - Written Method N4b *Answers*

1)	45	2)	79
_	2 3	_	4 5
	2 2		34
3)	67	4)	86
_	26	_	6 1
	4 1		25
5)	63	6)	3 4 5
_	4 7	_	26 3
_	16		82
7)	9 2 8	8)	783
_	3 63	_	596
	565		187

Multiplication by 2, 3, 4,**N5**5, and 10Answers

1) Fill in the missing numbers in the minitables below.

a)
$$\times$$
 10 4 5 3 b) \times 5 3 4 2
3 30 12 15 9 2 10 6 8 4
2 20 8 10 6 4 20 12 16 8
1 10 4 5 3 10 50 30 40 20
5 50 20 25 15 3 15 9 12 6

2) Work out a) $2 \times 17 = \underline{34}$ b) $24 \times 5 = \underline{120}$ c) $10 \times 9 = \underline{90}$ d) $4 \times 62 = \underline{248}$ e) $37 \times 3 = \underline{111}$ f) $2 \times 81 = \underline{162}$ g) $5 \times 32 = \underline{160}$ h) $3 \times 19 = \underline{57}$ i) $26 \times 4 = \underline{104}$ j) $11 \times 10 = \underline{110}$ Multiplication by 2, 3, 4, 5, and 10 *Answers*

1) a) **Use the table** to fill in the gaps below.

21 × 14 = <u>294</u>	×	11	12	13	14	15
12 x 19 - 228	18	198	216	234	252	270
	19	209	228	247	266	285
<u>21</u> × 15 = 315	20	220	240	260	280	300
286 ÷ 22 = <u>13</u>	21	231	252	273	294	315
	22	242	264	286	308	330

b) Give two different pairs of numbers.

<u>12</u> × <u>21</u> = 252

<u>14</u> × <u>18</u> = 252

2) Julia says:

"Multiply any number by five. The answer must be an odd number."

Is she correct? Circle **Yes** or **No**

Yes /No

Explain how you know. Any example which shows this is wrong such as: $2 \times 5 = 10$ and 10 is an even number.

Division by 2, 3, 4, 5, and 10 *Answers*

1) Work out a) $16 \div 2 = \underline{8}$ b) $30 \div 5 = \underline{6}$ c) $21 \div 3 = \underline{7}$ d) $40 \div 4 = \underline{10}$ e) $35 \div \underline{5} = 7$ f) $24 \div \underline{3} = 8$

2) Work out a) $46 \div 2 = \underline{23}$ b) $39 \div 3 = \underline{13}$ c) $65 \div 5 = \underline{13}$ d) $62 \div 4 = \underline{15 r2}$ e) $47 \div 3 = \underline{15 r2}$ f) $11 \div 10 = \underline{1 r1}$ g) $92 \div 4 = \underline{23}$ h) $57 \div 3 = \underline{19}$ i) $90 \div 5 = \underline{18}$ j) $83 \div 10 = \underline{8 r3}$

 Here is part of the 45 times table.
 Use the table to help you fill in the missing numbers.

N6

- a) $315 \div 7 = 45$ b) $135 \div 45 = 3$ c) $270 \div 6 = 45$ d) $9 \times 45 = 405$ e) $495 \div 45 = 11$ f) $20 \times 45 = 900$
- g) 450 ÷ 30 = <u>15</u>

 $2 \times 45 = 90$ $3 \times 45 = 135$ $4 \times 45 = 180$ $5 \times 45 = 225$ $6 \times 45 = 270$ $7 \times 45 = 315$ $8 \times 45 = 360$ $9 \times 45 = 405$ $10 \times 45 = 450$

 $1 \times 45 = 45$

2) Joe says:

"Divide any number by three. The answer must be an even number."

Division by 2, 3, 4,

5, and 10

Answers

Is he correct? Circle **Yes** or **No**

Yes /No

Explain how you know.

 $15 \div 3 = 5$ and 5 is an odd number.

- 1) a) How many millimetres are in a centimetre? 10
 - b) How many centimetres are in a metre? 100
 - c) How many metres are in a kilometre? 1000
 - d) Work out how many millimetres are in a metre. 1000
- 2) How many grams are in three kilograms? 3000
- 3) How many millilitres are in a five litres? 5000
- 4) In the table, work out what each item should be measured in.Your choices are mm, cm, m, km, g, kg, ml or l.

Amount of lemonade in a bottle	ml or l
Mass of a lemonade bottle	g or kg
Width of a lemonade bottle	mm or cm
Distance to the moon	km
Mass of a wasp	g
Length of a wasp	mm
Amount of blood in a human body	I

Units N7a Length, Mass and Capacity Answers

1) Try to match up A to F with U to Z





2) The ship is in a harbour.

There are ten rungs visible on the ship's ladder and they are 30 cm apart.

The tide is coming in and the water is rising at the rate of 20 cm per minute.

How many rungs will be visible after 9 minutes?

All ten rungs will still be visible because the ship floats. *Try this question with your parents.*



1) Write these times as 24 hour clock times



Draw these times on the clock faces.
 Underneath the clocks write whether the time is a.m. or p.m.



- 3) Peter wants to watch a programme which begins at 8.00 p.m.
 It is now 4.30 p.m.
 How much time will Peter have to wait?
 Three and a half hours (3 hours 30 minutes)
- Susie is going to watch a programme which begins at 20:30 and lasts for one hour and forty five minutes.
 What time will it finish? 22:15



- 1) Here is a train timetable for trains going from London Euston to Crewe.
 - a) How many trains stop at Tamworth? 4
 - b) If Tom gets to London Euston at 15:30 how long will he have to wait for a train to take him to Crewe? 16 mins
 - c) How many minutes does the 09:38
 London Euston train take to get to Northampton? 47 mins
 - d) How many minutes does the 14:23 Lichfield train take to get to Crewe? 46 mins
 - e) How long does the 17:48 London Euston train take to get to Crewe in hours and minutes? 1 hour and 46 mins
- 2) This is the easiest way but you need 22 minutes:



This is a harder way but it only takes 15 minutes:

Put the egg in the boiling water and set both timers off





after 7 mins



7

turn the 7 minute

after another 4 mins



turn the 7 minute timer over and wait for it to finish. You now have 15 minutes.





- Write the following amounts of money using a £ sign and numbers.
 - a) Three pounds and thirty seven pence. £3.37
 - b) Twenty four pounds and fifty pence. £24.50
 - c) Two hundred and five pounds. £205
 - d) Nine pounds and sixty pence. £9.60
 - e) Nine pounds and six pence. £9.06
 - f) Forty eight pence. £0.48
- 2) Write the following amounts of money in words.
 - a) £2.78 Two pounds and seventy eight pence
 - b) £6.07 Six pounds and seven pence
 - c) £5.40 Five pounds and forty pence
 - d) £0.24 Twenty four pence
- 3) Work out the following on a calculator and write the answers correctly:
 - a) £115.23 ÷ 23 £5.01
 - b) £100.80 ÷ 14 £7.20
 - c) 71p × 10 £7.10
 - d) £6.40 £3.83 + £2.10 **£4.67**
 - e) £14.83 + £6.17 £21

Three men went into a second-hand shop to buy a television.

Units - Money

Answers



N7c

This is a very famous question and has puzzled many generations of children.

The missing £1 is please ask your teacher, your parents and/or your friends.

We're just not allowed to tell you.

It was priced in the window at £30.

Each of them handed over £10 to the shop assistant.

As the assistant opened the till, the manager had a quiet word with him, "that TV is in the sale and is only £25 now, you will have to give them £5 back."

The assistant was very lazy and couldn't be bothered to count out the right change for each man.

Instead, he took 5 £1 coins out of the till.

He put two of them in his own pocket and gave each man £1 back.

Here's the problem:

The men have now paid £9 each for the TV.

The assistant has kept £2 for himself.

 $3 \times \pounds 9 = \pounds 27.$

 $\pounds 27 + \pounds 2 = \pounds 29.$

But £30 was handed over in the first place.

WHERE IS THE MISSING £1?

Reading Scales Answers

1) a) If water comes up to arrow A, how much will there be in the container? 1.25 L

N8

b) About how much water will there be if it comes up to arrow B?
 About 3.8 L





- If milk comes up to arrow A, how much milk will there be in the container? 125 ml
- How much milk will there be if it comes up to arrow B? 85 ml
 - Draw arrow C to show 140ml of liquid.



- 3) Use the scale to convert
 - a) 10 miles to km. 16 km
 - b) 40 km to miles. 25 miles
 - c) 16 miles to km. about 25.6 km
 - d) 8 km to miles. 5 miles

Reading Scales Answers

1) А В С

N8



Split the coins into three sets of three.

Put set A into one pan and B into the other. If they balance, the fake is in C.

If A is heavier than B then the fake is in B. If B is heaviest, the fake is in A. -

Take the set of three coins with the fake in it and put one coin in one pan and another coin in the other pan.

If they balance, the other coin is the fake.

If they don't balance, the one that goes up is the fake.

2) You have a 3 pint jug and a 5 pint jug and as much water from a tap as you like. How can you use the two jugs to measure out

exactly 4 pints of water?

Fill the 5 pint jug and pour it into the 3 pint jug. This leaves 2 pints in the 5 pint jug.

Empty the 3 pint jug and pour the 2 pints from the 5 pint jug into the 3 pint jug.

Fill the five pint jug and pour into the 3 pint jug until it is full.

This will leave you exactly 4 pints in the 5 pint jug.





5 Pints

3 Pints

9 Mathematical Symbols Answers

- 1) State the meaning of each of the following symbols
 - a) = Equal
 - b) \neq Not equal
 - c) < Less than
 - d) > Greater than
 - e) \leq Less than or equal
 - f) \geq Greater than or equal
- 2) Insert the correct symbol to make these sentences true
 - a) 4 + 5 > 6 + 2
 - b) 10−3 < 9 + 1
 - c) $6 + 2 = 2 \times 4$
- 3) State whether each statement is TRUE or FALSE
 - a) 7 < 4 FALSE
 - b) $68p = \pounds 0.68$ TRUE
 - c) 11 > 3 TRUE
- 4) You need to be 1.4 m or taller to ride on a rollercoaster. Write a mathematical statement about the heights of people (*h* metres) allowed on the rollercoaster. $h \ge 1.4$ m



- 1) Write down all the factors of:
 - a) 6 1 2 3 6
 - b) 8 1 2 4 8
 - c) 10 1 2 5 10
 - d) 12 1 2 3 4 6 12
 - e) 20 1 2 4 5 10 20
 - f) 21 1 3 7 21

- 2) 100 has nine factors.
 What are they?
 1 2 4 5 10 20 25 50 100
- The numbers 2, 3, 5 and 7 all have exactly two factors.
 Find the next four numbers with only two factors.
 - 11 13 17 19
- 4) The numbers 1, 4, 9 and 16 all have an odd number of factors.

Find the next three numbers which have an odd number of factors. 25 36 49

5) Put the correct numbers in the circles. Be careful of the overlaps.





Place all the whole numbers from 1 to 60 in the diagram below.

However, you must stick to these four rules:

- 1) In the rectangle you must have every whole number from 1 to 60
- 2) In circle A you must have all the factors of 60
- 3) In circle B you must have all the factors of 45
- 4) In circle C you must have all the factors of 36


N11 Multiples Answers

- 1) a) Write down the first five multiples of 3. 3, 6, 9, 12, 15
 - b) Write down the first five multiples of 7. 7, 14, 21, 28, 35
 - c) Write down the first five multiples of 4. 4, 8, 12, 16, 20
- 2) 6, 12, 18, 24, 30 are the first five multiples of which number? 6
- 3) What are the eighth, ninth and tenth multiples of 11? 88, 99, 110
- 4) Put the correct numbers in these circles. Be careful of the overlaps.





The sieve of Eratosthenes



Just follow these steps:

- a) Cross out 1.
- b) Shade in the square with 2 in it. Now cross out all other multiples of 2.
- c) Shade in the 3 square.Cross out all other multiples of 3 (some will already be crossed out).
- d) Shade in the 5 square. Cross out all other multiples of 5.
- e) Shade in the 7 square. There should be just three other multiples of 7 which haven't already been crossed out. Cross them out.
- f) Shade in every square that hasn't been crossed out.
- g) Write out the numbers in every shaded square.
- h) Prime numbers

N12 Number Patterns Answers

- 1) For each number pattern:
 - a) Describe the pattern
 - b) Work out what the next three terms are goes up in 2s
 - (i) 2, 4, 6, 8, 10, 12, 14, 16, 18 goes up in 3s
 - (ii) 1, 4, 7, 10, 13, 16, 19, 22, 25 goes up in 7s
 - (iii) 5, 12, 19, 26, 33, 40, 47, 54, 61 goes up in 5s
 - (iv) -2, 3, 8, 13, 18, 23, 28, 33, 38 goes down in 3s
 - (v) 36, 33, 30, 27, 24, 21, 18, 15, 12 goes up in 4s
 - (vi) -12, -8, -4, 0, 4, 8, 12, 16, 20 goes down in 9s
 - (vii) 100, 91, 82, 73, 64, 55, 46, 37, 28 goes up in 1.5s
 - (viii) 7, 8.5, 10, 11.5, 13, 14.5, 16, 17.5, 19

goes up by 3 then 5 then 7 etc OR square numbers (1×1) , (2×2) , (3×3) , etc

goes up by 2 then 3 then 4 etc OR triangle numbers

Number Patterns Answers

- Work out the next two terms for each of 1) the following number patterns:
 - a) 3, 8, 15, 24, 35, 48, 63
 - 4, 14, 36, 76, 140, 234, 364 b)
- 2) Work out the next two terms for each of the following number patterns:
 - 1, 2, 4, 8, 16, 32, 64, 128 a)
 - b) 2, 7, 22, 67, 202, 607, 1822
- Work out the next two terms for each of 3) the following number patterns:
 - a) 1, 1, 2, 3, 5, 8, 13, 21, 34, 55
 - 1, 2, 3, 6, 11, 20, 37, 68, 125, 230 b)

- 4) Work out the next two terms for each of the following :
 - First letters of 1, 2, 3, 4, etc O, T, T, F, F, S, S, E, N First letters of Jan, Feb, Mar, etc a)

 - b) J, F, M, A, M, J, J, A, S
 - 5) Choose any number between 1 and 20. If your number is even, halve it and write down the answer. If your number is odd, multiply it by three and add one. Write down the answer.

Look at your answer and follow the same rules:

If it is even you halve it and write down the answer.

If it is odd you multiply by three and add one and write down the answer.

Only stop when you get to one.

Try more starting numbers (of any size). Do they all go to one? Yes, mathematicians

think so.

What about if you use 27 as the number to start with?

It does eventually if you make no mistakes.

1321131123113112211	 6) Each row describes the row above. In the first row we have one 1. The second row says this (1 1) The third row describes the second row. We have two 1s and it says this (2 1) We now have one 2 and one 1. The fourth row is therefore 1 2 1 1 If you got this right you are one of a select few. 	1 11 21 1211 11221 312211 1312221 113213211 31131211312
---------------------	---	---

N13a Addition - Integers Answers

- 1) 1524 + 4273 = 5797
- 2) $7452 + 216 = \frac{7668}{2}$
- 3) 24578 + 1215 = 25793
- 4) 591 + 372 + 85 = $\frac{1048}{2}$
- 5) $9876 + 55 + 1039 = \frac{10970}{1000}$





N13b Addition - Decimals Answers

- 1) 59.1 + 37.2 = 96.3
- 2) 24.75 + 9.98 = 34.73
- 3) 94.78 + 104.9 = 199.68
- 4) 309 + 12.5 + 631.4 = 952.9
- 5) 105 + 7.32 + 51.8 + 2804 = 2968.12



Choose a number from a box and a number from a loop to make the totals in a) and b).





- 1) $14562 1251 = \frac{13311}{1}$
- 2) $6652 716 = \frac{5936}{2}$
- 3) $42160 39215 = \frac{2945}{2945}$
- 4) $2300 934 = \frac{1366}{1}$
- 5) 50000 2166 = 47834





Complete the boxes and the circles:



Short MultiplicationN15aIntegersAnswers

- 1) 3 × 13 = <u>39</u>
- 2) $55 \times 4 = 220$
- 3) $9 \times 64 = 576$
- 4) 92 × 5 = 460
- 5) $7 \times 87 = 609$
- 6) $342 \times 8 = \frac{2736}{2736}$
- 7) $6 \times 208 = \frac{1248}{2}$
- 8) 745 × 4 = $\frac{2980}{1000}$
- 9) $289 \times 7 = 2023$

Here are some items available from a local shop:







Short Multiplication

Integers Answers



Jacket: £17

Trainers: £56

MP3 player: £32

Television: £499

Work out the cost of:

N15a

a)	5 jac	kets
----	-------	------

b) 6 MP3 players

c) 4 pairs of trainers

d) 7 televisons

£85
£192
£224
£3493

N15b Short Multiplication Decimals Answers

1)
$$4 \times 1.2 = 4.8$$

- 2) $6.5 \times 3 = 19.5$
- 3) $9 \times 18.7 = \frac{168.3}{1000}$
- 4) $3.6 \times 5 = 18$
- 5) $7 \times 8.2 = \frac{57.4}{}$
- 6) $6 \times 1.39 = \frac{8.34}{1000}$
- 7) $9.2 \times 8 = \frac{73.6}{}$
- 8) 8.35 × 4 = $\frac{33.4}{}$
- 9) $3.62 \times 7 = \frac{25.34}{25.34}$
- 10) $25.3 \times 9 = \frac{227.7}{100}$



1) Here are some items available from a local shop:









Milk: £1.20

Bread: £0.65

Lollies: £0.30

Chocolates: £3.99

Work out the cost of:

- a) 7 lollies,
- b) 3 bottles of milk,
- c) 2 loaves of bread,
- d) 5 boxes of chocolates.
- Rulers cost £0.25 each.
 Pens cost £0.45 each.
 Kelly buys 3 rulers and 5 pens.

Work out how much she pays.

£2.10 £3.60 £1.30 £19.95

£3.00

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N16 Short Division of Integers *Answers*

- 1) 786 ÷ 2 = 393
- 2) $465 \div 5 = 93$
- 3) 448 ÷ 8 = <u>56</u>
- 4) $552 \div 6 = 92$
- 5) 801 ÷ 9 = <u>89</u>
- 6) 5976 \div 8 = <u>747</u>
- 7) 9080 \div 5 = <u>1816</u>
- 8) 17801 ÷ 7 = $\frac{2543}{2543}$
- 9) $18054 \div 6 = 3009$
- 10) $374877 \div 9 = 41653$



 Here are some items available from a local shop:



Work out the unit price of each item knowing that:

- 7 watches cost £336,
- 5 cameras cost £380,
- 4 camcorders cost £1260,
- 6 laptops cost £7794.
- 2) a) If 3 chairs cost £17.40, how much would one of them cost? ± 5.80
 - b) If 7 shirts cost £34.93, how much would one of them cost? $\pounds 4.99$

Multiplying and Dividing by N17a powers of 10 - Integers Answers

- 1) $75 \times 100 = \frac{7500}{100}$
- 2) $102 \times 10 = 1020$
- 3) $9 \times 1000 = 9000$
- 4) $450 \div 10 = 45$
- 5) $3800 \div 10 = 380$
- 6) $9700 \div 100 = ___97$
- 7) $60 \times 1000 = 60000$
- 8) $7000 \div 100 = ____$
- 9) $210 \times 1000 = 210000$

10) $1050000 \div 1000 = 1050$

Multiplying and Dividing by N17a powers of 10 - Integers Answers

The table shows the approximate populations of five different places.

Place	Approximate population
London	7 000 000
Glasgow	700 000
Barnsley	70 000
Penkbridge	7 000
High Bickington	700

Complete these sentences:

The population of **Barnsley** is about **10 times** bigger than the population of<u>Penkbridge</u> The population of<u>London</u> is about **100 times** bigger than the population of **Barnsley**. The population of Glasgow is about ..<u>100</u> **times** bigger than the population of **Penkbridge**.

The population of **Barnsley** is about **10 times** smaller than the population ofGlasgow.... The population of ..<u>High Bickington</u>. is about **100 times** smaller than the population of **Barnsley**. The population of High Bickington is about<u>10</u>. **times** smaller than the population of **Penkbridge**. Multiplying and Dividing by N17b powers of 10 - Decimals Answers

- 1) $3.6 \times 10 = 36$
- 2) $82.9 \times 100 = \frac{8290}{100}$
- 3) $0.5 \times 1000 = 500$
- 4) $47 \div 10 = 4.7$
- 5) $106.4 \div 10 = \frac{10.64}{10.64}$
- 6) $9.9 \div 100 = 0.099$
- 7) $6.2 \times 1000 = \frac{6200}{1000}$
- 8) $70 \div 1000 = 0.07$
- 9) $0.035 \times 10000 = 350$
- 10) $0.01 \div 100 = 0.0001$



1) Fill in the missing box in each case.



2) Using the fact below:

 $365 \times 17 = 6205$ Work out the following a) $36.5 \times 17 = 620.5$ d) $3650 \times 1.7 = 6205$ b) $36.5 \times 1.7 = 62.05$ e) $62.05 \div 17 = 3.65$

c) $365 \times 170 = 62050$ f) $6.205 \div 36.5 = 0.17$







Look at each shape, read the description and then draw in all the lines of symmetry.







In all four questions, reflect the shaded shape in the dotted mirror line.



Reflection G4a Horizontal and Vertical Mirror Lines Answers



3) Reflect the shape in the vertical mirror line. Then, reflect both shapes in the horizontal mirror line.



2) Use the grid to help you reflect Robbie Rabbit in the dotted mirror



4) Reflect the shape in the vertical mirror line. Then, reflect both shapes in the horizontal mirror line.





In all four questions, reflect the shaded shape in the dotted mirror line.





An art gallery uses a pictogram to show the number of paintings sold over a 5 week period.



- a) How many paintings were sold in week 1? 12
- b) In which week was the least number of paintings sold? Week 5
- c) How many paintings were sold in week 3? 10
- d) How many paintings were sold in week 4? 7
- e) How many more paintings were sold in week 2 compared with week 5? 12
- f) How many paintings were sold altogether in the five weeks? 49









- a) How many children chose green as their favourite colour? 5
- b) Which was the least favourite colour in the class? Yellow
- c) How many more children chose blue than red? 2
- d) How many children are in class 5A? 18



Number of different colour belts in a Judo club





1) Work out the value of each card and then place the cards in order from lowest to highest.



2) Work out the value of each card and then place the cards in order from lowest to highest.





Directed Numbers **N19a** Addition and Subtraction *Answers*

-8	-7	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8

- The temperature is 3°C at midnight and then falls 8 degrees by 6 a.m.
 What is the temperature at 6 a.m? <u>-5°C</u>
- 2) Tim has only £8 in his bank account but writes a cheque for £15.
 If the cheque is cashed, how much will Tim have in his account? -£7
- 3) Sue owes £7 to one friend and £6 to another friend.
 She writes this in her diary as (-7) + (-6)
 - a) How much does she owe altogether? b) What is (-7) + (-6)? -13 £13
- Sue still owes £7 to one friend and £6 to another friend but her mother decides to take away the £6 debt by paying it off.

Sue writes this as (-7) + (-6) - (-6)

- a) How much does Sue owe now? £7
- b) What is (-7) + (-6) (-6)? -7

- 5) Work out the answers to
 - a) 6 14 -8 b) 2 - 12 -10 c) -1 - 6 -7 d) -3 - 5 -8 e) -7 - 15 -22
- 6) Work out the answers to
 - a) 2 (-3)5b) 6 (-5)11c) -3 (-6)3d) -7 (-2)-5e) -20 (-18)-2
- 7) Work out the answers to

a) 5 + (-2) 3 b) 8 + (-6) 2 c) 3 + (-8) -5 d) -4 + (-3) -7

- e) -8 + (-4) -12
- 8) Work out the answers to
 - a) 4 (+1) 3
 - b) 7 (+5) 2
 - c) 1 (+3) -2
 - d) -6 (+1) -7
 - e) -1 (+6) -7



1) Each magic square below has a magic number written above it.

You must fill in the blank squares so that the rows, columns and diagonals add up to the magic number.



- 2) Work out which numbers should go in the squares to make the sums correct.
 - 2 = 9 a) 7 + b) 7 + |-2 | = 5 c) 8 = -6 2 – d) 4 --3 = 7 e) -5 – |-<mark>9</mark>| = 4 + 6 = 4f) g) -3 - 9 = -12-16 - 14 = -30 h)
Directed Numbers N19b Multiplication and Division Answers

- 1) a) $5 \times -7 = -35$
 - b) -3 × 6 = -18
 - c) $-4 \times -8 = 32$
 - d) $2.5 \times -2 = -5$
 - e) -4 × -1.5 = 6
- 2) a) $3 \times 2 \times -7 = -42$
 - b) $-5 \times -4 \times 3 = 60$
 - c) $9 \times 2 \times -2 = -36$
 - d) $-6 \times -2 \times -3 = -36$
 - e) $5 \times -8 \times -1 \times 2 = 80$
- 3) a) $8 \div -2 = -4$
 - b) $-16 \div 4 = -4$
 - c) $-20 \div -5 = 4$
 - d) $32 \div -8 = -4$
 - e) $-13 \div -2 = 6.5$
- 4) a) $-9 \times 7 \times 2 = -126$
 - b) $18 \div -4 = -4.5$
 - c) $-1 \times 2 \times -3 \times 4 \times -5 = -120$
 - d) $(24 \div -4) \times -5 = 30$
 - e) $(-50 \div 5) \times -2 = 20$

N20 BODMAS Answers

1) Work out the following:

a)	3 × 6 – 2	= 16
b)	7 + 2 × 3	= 13
c)	5 + 3 × 4 – 1	= 16
d)	(7 + 1) × 3	= 24
e)	$5 - 3 \times 2$	= -1
f)	9 – 35 ÷ 5	= 2
g)	$3 \times 2 + 7 + 5 \times 4$	= 33
h)	20 – 9 ÷ 3 + 1	= 18
i)	2 × (15 – 10) ÷ 5	= 2
j)	$7 + 2 - 3 \times 4$	= -3
k)	10 ÷ (2 + 3)	= 2
I)	10 ÷ 5 – 8 ÷ 2	= -2
m)	7 × (5 – 2) + 10	= 31
n)	$48 \div (2 + 3 \times 2)$	= 6
o)	4 × 12 ÷ 8 – 6	= 0

- 2) Work out the following:
 - a) $3^2 2^3 = 1$ b) $25 - (3 - 1)^2 = 21$ c) $8 \times 7 - \sqrt{16} = 52$
 - d) $36 \div 2^2 3 \times 3 = 0$
 - e) $5^3 (3 \times 15 2^5) = 112$
 - f) $((9+1) \times 4) \div 2 = 20$
- Place brackets in the following questions to make the answers correct.
 - a) 3 ×(5 1)= 12
 - b) (10 + 2)× 3 = 36
 - c) $7 \times (5-2) \times 2 = 42$
 - d) 24 ÷(6 − 2)= 6
 - e) $(3+2) \times 6 \div 10 = 3$
 - f) $5 \times (5-3) \div (4+1) = 2$
- 4) If x = 3 and y = 7, work out the following:

a)
$$2x - y$$
 = -1
b) $3y + x^2$ = 30

- c) $y^2 x^2 = 40$
- d) $(x + y)^2 x^3 = 73$
- e) $5(y-x) + (y+x) \div 2 = 25$
- f) $10xy (2y x)^2 = 89$



 Use the numbers 6, 3, 2 and 1 plus the operations +, -, ×, ÷ to make the numbers 0 to 9.
 The numbers must be used in the specified order (6, 3, 2, 1).
 They cannot be put together as in 63 for example.
 Signs can be used as many times as you like. Brackets can also be used.

0 = 6 - 3 - 2 - 1	5 = 6 ÷ 3 + 2 + 1
1 = 6 - 3 × 2 + 1	6 = 6 + 3 - 2 - 1
2 = 6 - 3 - 2 + 1	7 = 6 + 3 ÷ (2 + 1)
3 = (6 + 3)÷(2 + 1)	8 = 6 + 3 - 2 + 1
4 = 6 - 3 + 2 - 1	9 = (6 - 3)×(2 + 1)

These are just examples of how to get the answers. You may well have different correct answers.

2) Use four 4s plus the operations +, -, ×, ÷ to make the numbers 0 to 9.
All four 4s must be used. 4s cannot be put together as in 44.
Signs can be used as many times as you like. Brackets can

A possible answer for 0 could be $4 \div 4 - 4 \div 4$

 $0 = 4 + 4 - 4 - 4 \qquad 5 = (4 \times 4 + 4) \div 4$ $1 = (4 + 4) \div (4 + 4) \qquad 6 = (4 + 4) \div 4 + 4$ $2 = 4 \div 4 + 4 \div 4 \qquad 7 = (4 + 4) - (4 \div 4)$ $3 = (4 + 4 + 4) \div 4 \qquad 8 = 4 \times 4 - 4 - 4$ $4 = (4 - 4) \times 4 + 4 \qquad 9 = (4 + 4) + (4 \div 4)$

These are just examples of how to get the answers. You may well have different correct answers.

be used.



Real-Life Tables Distance Tables Answers

1)

London	All distances are in miles.					
195	Nottingham					
300	100	Manchester				
330	159	56	Liverpool			

a) Write down the distance between London and Nottingham. 195 miles

b) Write down the names of the two cities which are

- (i) The furthest apart. London and Liverpool
 - (ii) The least distance apart. Manchester and Liverpool
- Peter travels from London to Manchester where he collects a parcel. He then delivers the Parcel in Nottingham before returning to London. Work out the total distance travelled by Peter. 595 miles

2)

London	All distances are in miles.						
22	Stevenage						
75	48	Peterborough		_			
195	165	130	Doncaster				
235	210	170	45	York			

Emma lives in Doncaster.

She has to drive to Peterborough to pick up her friend, David, and then continue on to London to attend a graduation ceremony which begins at 11 am.

The ceremony will last two hours and she will then return to Doncaster with David.

- a) How far does Emma travel in order to get to London with David? 205 miles
- b) If Emma averages 50 mph on the return trip, at what time would she be back in Doncaster? 4.54 pm



1) Here is part of a railway timetable

Stockport	05:26	06:16	06:55	07:15	07:55
Stoke	05:55	06:45	07:24	-	-
Stafford	06:12	-	07:41	-	08:41
Euston	08:09	08:26	-	09:11	10:06

- a) Rosie wants to travel from Stockport to Euston. She must arrive in Euston before 09:00.
 - (i) What is the latest time she could depart from Stockport? 06:16
 - (ii) How long will her journey last? 2 hours and 10 minutes
- b) James gets to Stockport station at 07:00.
 How long will he have to wait for the next train to Stafford? 55 minutes
- c) Alex travels to Euston.
 She gets on the 07:24 train from Stoke.
 How long will her journey take? 2 hours and 42 minutes
- 2) The train route diagram show the times it takes to travel from Chester to other major stations on the line.

Use the information in the diagram to complete the following timetables.

Chester	04:22
Wrexham	04:38
Gobowen	04:57
Shrewsbury	05:17
Welshpool	05:38
Newtown	05:52

Wolverhampton	16:42
Telford	16:57
Wellington	17:03
Shrewsbury	17:17
Gobowen	17:37
Wrexham	17:56
Chester	18:12



90 minutes



- 1) Which four coins make a total of 77p? 50p 20p 5p 2p
- Six bars of metal each weigh 2.75 kg. How much do they weigh altogether? 16.5 kg
- At a party for 171 people, 9 guests sat at each table.
 How many tables were there?
 19 tables
- 4) Coke cans cost 43p each. How many cans you buy with £6?
 13 cans
- 5) Olivia went to a cafe. She ordered:

2 sausages Baked beans 3 coffee 1 juice



She paid with a £5 note.

Work out how much change she got. £1.34 change



- Cheese is on offer at £3.26 per kilogram. Emma buys half a kilogram. How much change does she receive from a £10 note? £8.37
- A mug and a plate together cost £2.90. The mug cost 40p more than the plate. How much does the plate cost? £1.25
- 3) A man is 27 cm taller than his son, who is
 8 cm shorter than his mother. The man was born
 42 years ago and is 1.78 m tall.
 How tall is his wife? 1.59 m
- 4) A bus starts at Birmingham and makes three stops before reaching London.
 At Birmingham, 37 people get on.
 At Rugby, 13 people get off and 6 get on.
 At Willen, 9 people get off and 15 get on.
 At Luton, 24 people get off and 8 get on.
 How many people are on the bus when it reaches London? 21 (I hope you remembered to count the driver)



- There are 7 people in a team.
 How many teams can you make from 131 people? 18 teams
- A motorist bought 26 litres of petrol at £1.19 per litre.
 - a) How much did it cost? £30.94
 - b) What change did he get from £50? £19.06
- 3) A museum trip is organised for 57 members of a youth club. They go in minibuses that can each seat up to 15 people.
 It costs £42.50 for each minibus and £172 for the group to access the museum.
 How much will the trip cost per person? £6.00
- 4) Mars Bars cost 35p. Skittles cost 45p. Gillian bought 5 bags of Skittles and some Mars Bars. She paid with a £5 note and received 30p change. How many Mars Bars did she buy? 7 Mars Bars



- Three consecutive integers have a sum of 105.
 What are they? 34 35 36
- Using the brackets keys of your calculator, work out the following.
 - a) 164 (27 + 56) = <u>81</u>
 - b) $44.8 \div (15.4 9.8) = 8$
 - c) $(19.8 3.3) \div (31.2 16.2) = 1.1$
 - d) $(8 \times 14.4) \div (11.1 4.7) = 18$
- 3) If you start with 16 and press the square root key of your calculator (√) twice, the answer given is 2.
 If you start with 81 and press the square root key of your calculator (√) twice, the answer given is 3.
 Complete the following sentences:
 - a) If you start with 1296 and press the square root key of your calculator twice, the answer given is
 6.
 - b) If you start with <u>625</u> and press the square root key of your calculator twice, the answer given is 5.



1) What fractions of the following shapes are shaded?



2) Shade the shapes according to the given fractions.





These are a selection of possible answers. As long as each of your four sections is comprised of four little squares, your answer is correct.



1) Find three equivalent fractions to each of the These are a selection of possible answers.



2) Fill in the missing number in each of these equivalent fractions.

a)
$$\frac{2}{3} = \frac{6}{9}$$
 b) $\frac{1}{5} = \frac{4}{20}$ c) $\frac{3}{11} = \frac{6}{22}$
d) $\frac{1}{3} = \frac{5}{15}$ e) $\frac{2}{7} = \frac{10}{35}$ f) $\frac{4}{9} = \frac{8}{18}$
g) $\frac{2}{5} = \frac{20}{50}$ h) $\frac{5}{7} = \frac{30}{42}$ i) $\frac{9}{10} = \frac{81}{90}$

3) Complete the following equivalent fraction series.

a)
$$\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{5}{10} = \frac{10}{20} = \frac{50}{100}$$

b) $\frac{3}{5} = \frac{6}{10} = \frac{9}{15} = \frac{12}{20} = \frac{30}{50} = \frac{300}{500}$

Introduction to Fractions $\sqrt{23h}$ **Equivalent Fractions** Answers 1) Here are six number cards. 6 12 2 8 4 10 a) Choose two of these six cards to make a fraction that is 2 equivalent to $\frac{1}{6}$. b) Choose two of these six cards 6 to make a fraction that is

equivalent to $\frac{12}{16}$.



2) Use the diagram below to help you fill in the missing numbers.





1) Cancel each of these fractions to their simplest form:

a)
$$\frac{2}{6} = \frac{1}{3}$$
 b) $\frac{5}{10} = \frac{1}{2}$ c) $\frac{3}{12} = \frac{1}{4}$

d)
$$\frac{2}{16} = \frac{1}{8}$$
 e) $\frac{9}{27} = \frac{1}{3}$ f) $\frac{20}{80} = \frac{1}{4}$

2) Cancel each of these fractions to their simplest form:

a)
$$\frac{4}{14} = \frac{2}{7}$$
 b) $\frac{30}{70} = \frac{3}{7}$ c) $\frac{16}{34} = \frac{8}{17}$

d)
$$\frac{24}{42} = \frac{4}{7}$$
 e) $\frac{27}{45} = \frac{3}{5}$ f) $\frac{28}{36} = \frac{7}{9}$

3) Cancel down fully each of these fractions:

a)
$$\frac{33}{55} = \frac{3}{5}$$
 b) $\frac{72}{96} = \frac{3}{4}$ c) $\frac{45}{90} = \frac{1}{2}$
d) $\frac{75}{100} = \frac{3}{4}$ e) $\frac{40}{180} = \frac{2}{9}$ f) $\frac{68}{116} = \frac{17}{29}$

Introduction to Fractions Simplifying Answers Here are six number cards. 5 9 Ζ a) Choose two of these six cards to make a fraction that is equal to $\frac{45}{2}$ b) Choose two of these six cards to make a fraction that is equal to $\frac{112}{144}$ c) Choose three of these six cards 4 to make a fraction that is equal to $\frac{28}{175}$

d) Choose three of these six cards to make the smallest



1) What percentage of the shapes below are shaded?



2) Shade in 45% of this grid.



Any 45 squares shaded.

3) Shade in 32% of this grid.



Any 8 squares shaded.

Percentages N24b Percentage of an Amount *Answers*

- 1) Work out the following:
 - a) 50% of 80 = 40
 - b) 50% of 48 = 24
 - c) 50% of 15 = **7.5**
 - d) 25% of 120 = 30
 - e) 25% of 90 = 22.5
- 3) Work out the following:
 - a) 10% of £40 = £4
 - b) 5% of £40 = £2
 - c) 15% of £40 **= £6**
 - d) 5% of £70 = £3.50
 - e) 15% of £380 **= £57**

- 2) Work out the following:
 - a) 10% of 150 = 15
 - b) 10% of 26 = 2.6
 - c) 50% of 12 = 6
 - d) 25% of 12 = 3
 - e) 75% of 12 = 9
- 4) Work out the following:
 - a) 20% of £50 = **£10**
 - b) 45% of £9 = £4.05
 - c) 80% of £11 **= £8.80**
 - d) 35% of £6 = £2.10
 - e) 65% of £824 = £535.60
- 5) Jamie received £26 pocket money last week.

He spent it as follows: ____ 10% on sweets,

___ 25% on magazines

__ 15% on games

How much did Jamie have left?10% + 25% + 15% = 50%Show your working.Therefore he had 50%left which is £13

6) Tony had £40 saved up and gave 35% of it to his younger sister, Ella.
Ella gave 20% of what she was given to her younger brother, Ben.
Ben gave 30% of what he was given to his younger brother, Tim.
Tim spent 75% of what he was given on buying a toy for his hamster, Hammy.
How much was the toy for Hammy? £0.63

N25 Powers and Roots Answers

- 1) a) Shade all the square numbers in the grid.
 - b) Put a circle round all the cube numbers in the grid.

1	2	3	4	5	6	7	8	9	10	11	12
13	14	15	16	17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48
49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81	82	83	84
85	86	87	88	89	90	91	92	93	94	95	96
97	98	99	100	101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132
133	134	135	136	137	138	139	140	141	142	143	144

- 2) a) What is the square root of 169? 13
 - b) What is the cube root of 64? 4
- Add together the square root of 81 with the cube root of 216.
 Now, square the result.
 What is your final answer? 225

V26 Function Machines and Inverse Operations *Answers*

1) Find the **output** for each of these function machines.



2) Find the **input** for each of these function machines.





Complete the diagram below. Every time you see dashes like this _____, you need to write the correct number or expression. One of them (5x - 7) has already been done for you.



Rounding N27a Nearest 10, 100, 1000 Answers

Using a calculator, work out the following. Give your answers to the nearest 10.

- a) 24×14 340 to the nearest 10
- b) 383 × 43 16470 to the nearest 10
- c) $4088 \div 56$ 70 to the nearest 10
- d) 265364 ÷ 326 810 to the nearest 10
- e) $(42000 + 768) \div 54$ 790 to the nearest 10



Round the following numbers to 1 decimal place.

a)	4.21	4.2	f)	578.48	578.5
b)	53.43	53.4	g)	79.035	79.0
C)	31.59	31.6	h)	3443.77052	3443.8
d)	8.827	8.8	i)	26.9999	27.0
e)	0.653	0.7	j)	99.961	100.0

Rounding Decimal Places Answers

Round each of the numbers on the calculators to

- (i) 1 d.p.
- (ii) 2 d.p.
- (iii) the nearest whole number.





D

6

7

5

4

 $\xrightarrow{8} X$

- G (5.5, 7.5)
- H (8, 8)

2

1

3

1

0+0





- Put crosses at the following points and label them with the correct letters.
 - A (-5, 3)
 - B (2, -4)
 - C (-2, -6)
 - D (5.5, 3)
 - E (0, 0)
 - F (-3, 0)
 - G (-6, -5)
 - H (0, -5)







1) Translate the shape 5 squares to the right and 2 squares up.

3) Translate the shape with vector $\begin{pmatrix} -4 \\ 3 \end{pmatrix}$

2) Translate the shape 3 squares to the left and 2 squares down.



4) Translate the shape with vector $\begin{pmatrix} 4 \\ -5 \end{pmatrix}$



Use tracing paper and translate the following shapes.





1) Rotate the shape 90° about the cross.

3) Rotate the shape 180° about the cross.



2) Rotate the shape 90° about the cross.



4) Rotate the shape 90° clockwise about the cross.





- a) Rotate triangle A 90° clockwise about cross 1. Label your new triangle B.
- b) Rotate triangle B 90° clockwise about cross 2. Label your new triangle C.
- c) How many degrees would you need to rotate triangle A to get to triangle C? 180°
- d) Mark with a cross the centre of rotation to get from A to C.





G7 Rotational Symmetry Answers

- 1) a) Shade in one square so that this shape has rotational symmetry of order 2.
- b) Shade in a different square so that this shape has rotational symmetry of order 2.

These are the two different answers

2) Shade three more squares so that the grid has rotational symmetry of order 4.



 3) Seven
 upside down
 in the mirror

 CHLOE
 X31XX8
 BAXTER

 BAXTER
 307H3
 CHCOE

B, X, E, C, H, O, E can all be read the same



1) Find the perimeter of this rectangle on the cm grid.

P = 20cm							

3) Find the perimeter of this shape on the cm grid.

P = 20CIII							

2) Find the perimeter of this shape on the cm grid.



4) Find the perimeter of this shape on the cm grid.P = 20cm



Perimeters Counting Squares Answers

G8a







1) Find the area of the rectangle on this centimetre grid.

Area = 20cm²

2) Find the area of the rectangle on this centimetre grid.



3) Find the area of the rectangle on this centimetre grid. Area = 61.75cm²






 Draw three different-shaped rectangles with an area of 12cm² on the centimetre grid.

2) Find the area of the square on this centimetre grid.



This is a difficult question

Find the area of the square on this centimetre grid. Area = 20cm²













Draw the angle where you see the dot.



The Probability Scale

Answers

Estimate a probability (decimal) to go with these:

- a) You will be on time for school on the next school day.
 Your teacher will need to check this answer.
- b) It will snow sometime this week. This depends on what month it is and where you live.
- c) Your teacher will smile at least once tomorrow.
 It might be better not to show your teacher this answer.
- d) You will have a disagreement with one of your friends.
 Only you and your friends can check this.
- e) England will win the World Cup in 2018. This is your opinion.
- f) England or France will win the World Cup in 2018.

To be correct, this answer **must** be bigger than the answer to question e).

	S 3	Frequency Ta Ungrouped Answer	ables Data Is
1)	Colour	Tally	Total
	Blue	JHT	7
	Green	JH+ IIII	9
	Red		11
	Yellow		3
2)	No. of children	Tally	Total
	1	HH	7
	2	JHT JHT	12
	3	JHT	6
	4		4
	5		1
	6		1
3)	Pets	Tally	Total
	Dog		11
	Cat		10
	Hamster	·	13
	Goldfish		8
	Snake		2

MANY YEARS AGO IN A FAR-OFF LAND THERE LIVED AN

OGRE OF HUGE PROPORTIONS.

HIS FAVOURITE OCCUPATION WAS TO CAPTURE POOR

PEASANTS AND MAKE THEM WORK FOR FREE ON HIS LAND.

HE WASN'T VERY NICE.

THE NAME OF THE OGRE WAS LANCE.



1) Here are the Maths test marks for two mixed ability Year 7 classes.

43	16	68	49	31	24	83	61	55	40	72	44	45	23	48	33	20
81	63	58	41	50	59	46	35	24	13	66	99	53	47	66	48	51
33	35	40	64	50	31	37	42	35	54	97	24	33	48	53	42	

Complete the frequency table to show all the results.

Mark	Tally	Frequency
20 and under		3
21 - 30		4
31 - 40	JHT JHT I	11
41 - 50	JHT JHT IIII	14
51 - 60	JHT	7
61 - 70	JHT	6
over 70	# ##	5

2) A group of students measured their hand span (*s*) in in centimetres. Here are their results:

14.7	20.0	16.7	21.6	18.2	17.9	18.1
19.0	19.9	16.0	14.4	19.1	21.8	16.4
17.9	15.9	18.0	19.1	16.5	21.1	18.9

Complete the frequency table to show all the results.

Class interval	Tally	Frequency
14 < s < 16		3
16 < s < 18	JHT I	6
18 < s < 20	1HT III	8
20 < s < 22		4



Sally, the organiser of a slimming club, keeps data on how much weight (w), in kg, her 60 members have lost over the previous twelve months.

She organises the data in a two-way table.

	Men	Women	Total
0 < w < 5	2	4	6
5 < <i>w</i> < 10	4	10	14
10 < <i>w</i> < 15	7	9	16
15 < <i>w</i> < 20	2	8	10
20 < w < 25	3	11	14
Total	18	42	60

- a) Complete the two-way table.
- b) How many members of the club were women? 42
- c) How many women lost between 5 and 10 kg? 10
- d) How many men lost less than 20 kg? 15
- e) How many men lost 5 kg or more? 16
- f) How many men and women lost 15 kg or more? 24

N28aLong Multiplication
Integers
Answers

- 1) $17 \times 32 = 544$
- 2) $24 \times 62 = \frac{1488}{2}$
- 3) $13 \times 156 = \frac{2028}{2028}$
- 4) 528 × 16 = <u>8448</u>
- 5) $34 \times 466 = 15844$

N28bLong MultiplicationDecimals
Answers

- 1) $1.5 \times 22 = 33$
- 2) $7.6 \times 2.1 = 15.96$
- 3) $4.5 \times 9.99 = 44.955$
- 4) $19.7 \times 6.3 = 124.11$
- 5) $0.35 \times 0.12 = 0.042$



1) Work out what the 🖈 must be.



2) A school organises a trip to a museum.

They set off in 13 minibuses, each minibus containing 24 pupils who will each pay to go into the museum.

Entrance to the museum costs £1.20 per person.

- a) How many people made the trip? 312
- b) What was the total cost? £374.40



- 1) 288 ÷ 12 _{= 24}
- 2) 285 ÷ 15 = <u>19</u>
- 3) 425 ÷ 25 = <u>17</u>
- 4) $784 \div 56 = 14$
- 5) $874 \div 38 = 23$

N29bLong DivisionDecimals
Answers

- 1) $79.2 \div 22 = 3.6$
- 2) $5.89 \div 19 = 0.31$
- 3) $9.87 \div 47 = 0.21$
- 4) $330.2 \div 13 = 25.4$
- 5) $42.624 \div 16 = 2.664$



1)	a)	If 48 luxurious pens cost £768, how much would one of them cost?	£16
	b)	If 25 tee shirts cost £77.50, how much would one of them cost?	£3.10
	c)	If 53 mobile phones cost £2119.47, how much would one of them cost?	£39.99

2) Cans of juice cost 24p each.

Wendy has £8.65 to spend.

- a) What is the maximum number of cans Wendy can buy? 36
- b) How much change does she get? £0.01 or 1p
- 3) Find the missing digits.



1) Write down the first 9 prime numbers.

2, 3, 5, 7, 11, 13, 17, 19, 23

- 2) Write down the first prime number that comes after 62. 67
- 3) Split up the following numbers into the product of their prime factors.

a)	12	2 × 2 × 3	d)	120	2 × 2 × 2 × 3 × 5
b)	45	3 × 3 × 5	e)	550	2 × 5 × 5 × 11
c)	72	2 × 2 × 2 × 3 × 3	f)	1296	2 × 2 × 2 × 2 × 3 × 3 × 3 × 3

4) Find the Highest Common Factor (HCF) of the following numbers.

a)	4 and 6	2	d)	300 and 525	75
b)	8 and 16	8	e)	374 and 918	34
c)	36 and 48	12	f)	45, 90 and 105	15



Answers

1) Find the Highest Common Factor (HCF) of the following numbers.

a)	4 and 6	2	d)	300 and 525	75
b)	8 and 16	8	e)	374 and 918	34
c)	36 and 48	12	f)	45, 90 and 105	15

2) Find the Lowest Common Multiple (LCM) of the following numbers.

a)	8 and 12	24	d)	4, 6 and 8	24
b)	30 and 45	90	e)	24 and 84	168
c)	15 and 18	90	f)	72 and 96	288

3) The bells at Kings School ring every 6 minutes.

At Queens School the bells ring every 5 minutes.

At Princess School the bells ring every 9 minutes.

All three bells ring together at 8.30 am.

When is the next time the bells of the three schools will ring together? 10 am



1) Complete the tables.

a)			b)		
Fraction	Decimal	Percentage	Fraction	Decimal	Percentage
<u>1</u> 2	0.5	50%	<u>68</u> 100	0.68	68%
<u>1</u> 4	0.25	25%	<u>7</u> 20	0.35	35%
<u>1</u> 10	0.1	10%	<u>3</u> 5	0.6	60%
<u>1</u> 3	0.3	33.3%	<u>2</u> 3	0.6	66.6%
<u>7</u> 10	0.7	70%	<u>1</u> 20	0.05	5%
<u>2</u> 5	0.4	40%	<u>13</u> 50	0.26	26%

2) Put these fractions, decimals and percentages in order, smallest to largest.

a)	$\frac{1}{2}$, 49%, $\frac{3}{5}$, 0.55	49%	<u>1</u> 2	0.55	<u>3</u> 5
b)	27%, 0.2, $\frac{1}{4}$, $\frac{3}{10}$	0.2	<u>1</u> 4	27%	<u>3</u> 10
c)	$\frac{9}{10}$, 95%, 0.99, $\frac{97}{100}$	<u>9</u> 10	95%	<u>97</u> 100	0.99
d)	$\frac{1}{3}$, 0.6, $\frac{2}{3}$, 30%	30%	<u>1</u> 3	0.6	<u>2</u> 3
e)	0.125, 10%, <u>11</u> , 0.09	0.09	1 0%	<u>11</u> 100	0.125

3) Chris says that $\frac{3}{4}$ is halfway between 0.5 and 100%.

Is Chris correct? You must explain your answer. Yes. 0.5 is $\frac{2}{4}$ and 100% is $\frac{4}{4}$ and $\frac{3}{4}$ is halfway between them.

4) Emily says that 0.2 is halfway between 10% and $\frac{3}{5}$.

Is Emily correct? You must explain your answer. No. 10% is 0.1 and $\frac{3}{5}$ is 0.6 and 0.2 is not halfway between them.

N33 Fraction of an Amount Answers

- 1) Find the following:
 - a) $\frac{1}{3}$ of 24 = 8 b) $\frac{2}{3}$ of 24 = 16
 - c) $\frac{1}{5}$ of 30 = 6 d) $\frac{3}{5}$ of 30 = 18
 - e) $\frac{1}{8}$ of 40 = 5 f) $\frac{5}{8}$ of 40 = 25
- 2) Work out:
 - a) $\frac{7}{10}$ of £30 = £21 b) $\frac{3}{7}$ of £84 = £36
 - c) $\frac{4}{5}$ of £1.50 = £1.20 d) $\frac{11}{20}$ of £19 = £10.45
 - e) $\frac{2}{9}$ of £10.98 = £2.44 f) $\frac{8}{13}$ of £31.85 = £19.60
- 3) Julie has £4.50 pocket money every week. If she spends $\frac{2}{5}$ of it on a magazine and $\frac{1}{3}$ of it on a dance lesson, how much of the pocket money does she have left? £1.20
- 4) Paul has £7.80 pocket money each week. He always saves $\frac{1}{3}$ of it. With the remaining money he spends $\frac{5}{8}$ on comics and the rest on sweets.
 - (i) How much does he save? £2.60
 - (ii) How much is spent on comics? £3.25
 - (iii) How much does he spend on sweets? £1.95

N33Fraction of an AmountAnswers

1) a) Find
$$\frac{1}{2}$$
 of $\left(\frac{2}{3} \text{ of } 60\right) = 20$
b) Find $\frac{3}{4}$ of $\left(\frac{1}{2} \text{ of } 80\right) = 30$
c) Find $\frac{1}{2}$ of $\frac{4}{9}$ of $\frac{3}{4}$ of $42 = 7$

3) If
$$\frac{1}{2}$$
 of $\frac{1}{5}$ of a number is 6, what is the number? 60

4) If
$$\frac{1}{2}$$
 of $\frac{1}{3}$ of $\frac{1}{4}$ of $\frac{1}{5}$ of a number is 2.5, what is the number?
300

5) If
$$\frac{3}{5}$$
 of $\frac{1}{2}$ of $\frac{2}{3}$ of a number is 3.8, what is the number? 19





Largest

N35 Improper Fractions Mixed Numbers Answers

1) Convert the following improper fractions to mixed numbers.

a)	<u>5</u> 4	$1\frac{1}{4}$	f)	<u>25</u> 3	$8\frac{1}{3}$
b)	<u>8</u> 3	$2\frac{2}{3}$	g)	<u>30</u> 7	$4\frac{2}{7}$
c)	<u>12</u> 7	$1\frac{5}{7}$	h)	<u>75</u> 8	$9\frac{3}{8}$
d)	<u>20</u> 9	$2\frac{2}{9}$	i)	<u>47</u> 12	3 <u>11</u> 12
e)	<u>16</u> 5	$3\frac{1}{5}$	j)	1 <u>00</u> 9	11 <u>1</u>

2) Convert the following mixed numbers to improper fractions.

a)	$1\frac{3}{5}$	<u>8</u> 5	f) 10 <u>1</u>	<u>91</u> 9
b)	$2\frac{1}{4}$	<u>9</u> 4	g) 7 <u>5</u>	<u>61</u> 8
c)	$5\frac{2}{3}$	<u>17</u> 3	h) 9 <u>4</u>	<u>49</u> 5
d)	$3\frac{3}{5}$	<u>18</u> 5	i) 6 <u>3</u> 11	<u>69</u> 11
e)	11 <u>2</u> 7	<u>79</u> 7	j) 12 <u>3</u>	<u>51</u> 4

3) Put these numbers in order, lowest to highest.

a)	3.5, $3\frac{1}{5}$, $\frac{11}{3}$	$3\frac{1}{5}$ 3.5 $\frac{11}{3}$
b)	$7\frac{1}{4}$, 7.14, $\frac{34}{5}$	$\frac{34}{5}$ 7.14 7 $\frac{1}{4}$
c)	$1\frac{1}{10}$, 98%, $\frac{5}{4}$, 1	98% 1 1 $\frac{1}{10}$ $\frac{5}{2}$

Fractions N36 Adding and Subtracting Answers

1) Work out the following, simplifying your answers where possible.

a)	$\frac{2}{7} + \frac{3}{7} = \frac{5}{7}$	e)	$\frac{1}{6} + \frac{1}{6}$	$\frac{2}{3} =$	<mark>3</mark> 18 +	<mark>12</mark> 18 =	<u>5</u> 6
b)	$\frac{3}{8} + \frac{1}{8} = \frac{1}{2}$	f)	$\frac{1}{6} + \frac{1}{6}$	$\frac{2}{3} =$	<mark>1</mark> 6 +	$\frac{4}{6} =$	<u>5</u> 6
c)	$\frac{7}{9} - \frac{2}{9} = \frac{5}{9}$	g)	<u>4</u> 5	<u>1</u> =	<u>3</u> 10		
d)	$\frac{5}{10} - \frac{1}{10} = \frac{2}{5}$	h)	<u>14</u> – - 15 – -	<u>3</u> 5 =	<mark>14</mark> 15 -	<mark>9</mark> 15 =	<u>1</u> 3

2) Work out the following, simplifying your answers where possible.

a)	$\frac{3}{8} + \frac{4}{8} = \frac{7}{8}$	f)	$\frac{5}{6} - \frac{1}{4} = \frac{7}{12}$
b)	$\frac{9}{11} - \frac{5}{11} = \frac{4}{11}$	g)	$\frac{5}{12} + \frac{1}{6} = \frac{7}{12}$
c)	$\frac{1}{2} + \frac{1}{3} = \frac{5}{6}$	h)	$\frac{4}{5} - \frac{1}{10} = \frac{7}{10}$
d)	$\frac{5}{7} - \frac{3}{5} = \frac{4}{35}$	i)	$\frac{3}{8} + \frac{1}{2} = \frac{7}{8}$
e)	$\frac{1}{2} + \frac{2}{5} = \frac{9}{10}$	j)	$\frac{8}{9} - \frac{5}{6} = \frac{1}{18}$

3) Write the missing numbers in each of these fraction sums.

a)
$$\frac{1}{3} + \frac{4}{6} = 1$$

b) $\frac{3}{7} + \frac{12}{21} = 1$
c) $\frac{8}{5} - \frac{9}{15} = 1$
d) $\frac{15}{12} - \frac{1}{4} = 1$



- 1) Work out the following, giving your answers in their simplest forms
 - a) $3 \times \frac{1}{4}$ $\frac{3}{4}$ e) $4 \times \frac{4}{9}$ $\frac{16}{9}$ b) $7 \times \frac{1}{7}$ 1f) $10 \times \frac{3}{8}$ $\frac{15}{4}$ c) $2 \times \frac{4}{5}$ $\frac{8}{5}$ g) $\frac{8}{9} \times 6$ $\frac{16}{3}$ d) $9 \times \frac{1}{3}$ 3h) $\frac{2}{15} \times 3$ $\frac{2}{5}$

2) Work out the following, giving your answers in their simplest forms

a)	1/2 of £40 £20	e)	$\frac{2}{5}$ of 30 cm 12 cm
b)	$\frac{1}{5}$ of 20 km 4 km	f)	$\frac{7}{8}$ of £16 £14
c)	1/4 of 120 kg 30 kg	g)	$\frac{4}{7}$ of 7000 g 4000 g
d)	1 9 of £99 £11	h)	$\frac{3}{4}$ of £500 £375

3) Work out the following, giving your answers in their simplest forms

a)	$3 \div \frac{1}{4}$ 12	e)	$10 \div \frac{2}{3}$	15
b)	$7 \div \frac{1}{2}$ 14	f)	$8 \div \frac{4}{5}$	10
c)	$12 \div \frac{1}{3}$ 36	g)	$3 \div \frac{5}{7}$	<u>21</u> 5
d)	9 ÷ $\frac{1}{5}$ 45	h)	$15 \div \frac{2}{3}$	<u>45</u> 2

- 4) An industrial machine takes $\frac{3}{4}$ of an hour to produce a very special tool. How long would it take the machine to produce 12 of the tools? **9 hours**
- 5) A road is 20 km long. Road signs are to be installed every ²/₃ of a kilometre. How many signs will be needed?
 30 signs, assuming that there isn't a sign at the beginning of the road.

A2 Algebraic Vocabulary Answers

- 1) State whether each of the following is an expression, an equation or an inequality:
 - a) 2x + 4 = 9 Equation
 - b) 3x + 4y Expression
 - c) 5a 1 < 10 Inequality
 - d) 6b + 7d = 20 Equation
 - e) 9 < 5x Inequality
- 2) How many terms does each of the following have?
 - a) 3*a* + 4 2
 - b) 2x + 3y 4z 3
 - c) 5 + 2n + 3m 4p 4
- 3) a) Write down any two numbers that are factors of 24 Any two from 1, 2, 3, 4, 6, 8, 12, 24
 - b) Write down all the factors of 12.
 1, 2, 3, 4, 6, 12
 - c) Is 3 a factor of 3x + 9? Yes Explain how you know. Because it can be written as 3(x + 3)



Answers

- A vintage car hire firm charges £70 for the first day's hire followed by £55 per day for all other days.
 - a) How much would it cost to hire a car for 2 days? £125
 - b) How much would it cost to hire a car for 9 days? £510
 - c) When Sue hires a car it costs her £345.How many days did she hire the car for? 6 days
- 2) It costs 4p per copy on the school photocopier.
 - a) How much would it cost to make 15 single-sided copies? 60p
 - b) Jane has to make 6 copies of a document which is double-sided (writing on both sides).
 How much will it cost? 48p
 - c) Ted copies a single-sided document but forgets how many copies he has made.
 Rather than counting them he simply looks at the bill and works it out from there.
 - The bill was for £2.20.

Single-sided copies 4p each



How many copies had he made? 55 copies



- 3) a) If Simon puts 7 into the number machine, what number comes out? 17
 - b) If 100 goes in, what comes out? 203
 - c) If 51/2 goes in, what comes out? 14
 - d) If 2.25 goes in, what comes out? 7.5
 - e) If 25 comes out, what number was put in? 11
 - f) If 8 comes out, what number was put in? 2.5
 - g) If x goes in, what comes out? $x \times 2 + 3$ or $2 \times x + 3$ or 2x + 3

preferred

3 Formulae Expressed in Words Answers

1) Choose any number. xAdd three to it. x + 3Multiply your result by two. 2x + 6Add six to it. 2x + 12Halve your answer. x + 6Subtract your original number. 6

> You should be left with six. Try to find out why you are always left with six.

2)	Input	Output	3)	Input	Output
	1	2		1	-4
	4	<u>14</u>		4	8
	10	<u>38</u>		10	<u>32</u>
	2.5	8		2.5	2
	-3	<u>-14</u>		-3	<u>-20</u>
	8	30		<u>9.5</u>	30
	<u>12.5</u>	48		<u>14</u>	48
	-4	-18		- <u>2.5</u>	-18
	X	4 <i>x</i> - 2		X	4(<i>x</i> - 2)



A4

Algebraic Notation

Answers

What expression do I have if I think of a number, double it and then add three?

Answer: 2*x* + 3

- Write down the expression you will have if you think of a number (let x be the number) and then:
 - a) add three to it x + 3
 - b) double it 2x
 - c) multiply it by three and then subtract four 3x 4
 - d) multiply it by itself $x \times x$ or x^2
 - e) divide it by two $\frac{x}{2}$
 - f) divide it by two and then add one $\frac{x}{2}$ + 1
 - g) add three to it and multiply the result by two 2(x + 3)
 - h) multiply it by five, add four, divide the result by two $\frac{5x+4}{2}$
- 3) If s = 2v, work out the value of s when v = 7 s = 14
- 4) If y = 3t + 4, work out the value of y when t = 5 y = 19
- 5) If g = 2t 1, work out the value of g when t = 9 g = 17
- 6) If f = 2(t + 8) and t = 3, find the value of f f = 22
- 7) If d = 3(2e 3) and e = 5, find the value of d = 21

Say what the expression 4x + 17 means in words.

Answer: Take a number, multiply it by four and then add seventeen.

- 2) Say what the following expressions mean in words.
 - a) x + 6 Take a number and add six to it
 - b) x-7 Take a number and subtract seven
 - c) 8x Take a number and multiply it by eight
 - d) 4x + 2 Take a number, multiply it by four and then add 2
 - e) $\frac{x}{5}$ Take a number and divide it by five
 - f) 6(x + 7) Take a number, add seven to it and multiply the result by six

g) 4(3x-1) Take a number, multiply it by three, subtract 1 and then multiply the result by four

- 8) If c = 4 and d = 3, find the value of:
 - a) 2c 8
 - b) 2*c*-*d* 5
 - c) cd 12
 - d) 5c + 2d 26
 - e) 10*cd* 120
 - f) 2(c+d) 14
 - g) 5(3c-2d) 30



Answers

The body mass index (BMI) is a measure used to show if an adult is at a healthy weight. It doesn't apply to children, only adults.

Here is a formula for calculating BMI

$$BMI = (weight in kg) \div (height in m) \div (height in m)$$

A person with BMI between 18.5 and 25 is at a healthy weight.

A person with BMI less than 18.5 is underweight.

A person with BMI between 25 and 30 is overweight.

A person with BMI over 30 is obese.



Here are the heights and weights of the four people above. They are in no particular order.

Height (m)	1.74	1.82	1.62	1.62
Weight (kg)	70	57	55	74
BMI	23	17	21	28

- a) Work out the BMI for each height and weight and put them in the table. Give your answers to the nearest whole number.
- b) Match each height, weight and BMI with the correct person.
- c) For each person, decide whether he/she is underweight, healthy, overweight or obese write the answer next to each person.
- A woman is 1.65 m tall and weighs 45.6 kg.
 She worries that she is overweight.
 Is she right? No, she has a BMI of 16.7 and is underweight

A5 Horizontal and Vertical Lines Answers



Collecting Like Terms Answers

- Simplify these expressions 1)
 - 3a + 4a = **7a** a)
 - b) b + 4b = 5b
 - c) 5x x = 4x
 - d) 6d + 3d 2d = 7d
 - 2k + k + k 3k = ke)

- f) 3r 2r + 4r = 5r
- g) 5t 3t + t + 2t = 5t
- h) 7p p + 2p 5p = 3p
- i) -4y + 2y y + 4y = y
- j) -2c + c 3c c = -5c
- Simplify these expressions 2)
 - a + b + a + b = 2a + 2ba)
 - b)
 - c)
 - d) 5r+6p-2r-3p = 3r+3p i) v-4w-5v-2w = -4v-6w
 - e) 4c + 8d 3c + d = c + 9d
- f) 6x 4y + 7y 2x = 4x + 3y
- 3a + 2a + 4b + b = 5a + 5b g) 2k 3l k + 10l = k + 7l
- 7x + 2y + x + 3y = 8x + 5y h) 3m + 5n + 7m 7n = 10m 2n

 - j) -3x y 3y x = -4x 4y
- 3) Simplify these expressions
 - a) 7xy 2xy = 5xy
 - b) 5cd + 3dc = 8cd
 - c) $x^2 + 4x^2 + 2x^2 = 7x^2$

d)
$$9y^3 + y - 2y^3 = 7y^3 + y$$

- 3ab + 7ab 2a = 10ab 2a j) e)
- f) 6m + 2pr m + 3rp = 5m + 5prg) $10a^2d + 2y - 3da^2 + y^2 = 7a^2d + 2y + y^2$ h) $bz^2 + 4t^3 - 3t^3 - 5zb^2 = bz^2 + t^3 - 5zb^2$ $2r^{2}b + 5r^{2} - r + 6br^{2} = 8br^{2} + 5r^{2} - r$ i)

$$8x^{3}y + 2w - 5w - 3yx^{3} = 5x^{3}y - 3w$$

Algebraic Simplification Multiplication *Answers*

1) Simplify the following

a)	6 × <i>x</i>	6 <i>x</i>
b)	$2 \times x \times y$	2 <i>xy</i>
c)	6 × <i>x</i> × 3 × <i>y</i>	18 <i>xy</i>
d)	s×t×u	stu
e)	$7 \times s \times 2 \times t \times u$	14 <i>stu</i>

2) Simplify the following

a)	x	X ⁴

- b) $t \times t \times t \times t \times t \times t \times t \times t$
- c) $g \times g$ g^2
- d) $x \times x \times x \times y \times y \times y \times y \times y \times y^{4}$
- e) $x \times y \times x \times y \times y$ $x^2 y^3$

3) Simplify the following

- a) $x \times x^2$ x^3
- b) $y^3 \times y^4$ y^7
- $C) \qquad X^2 \times X^3 \times X \qquad \qquad X^6$
- d) $g \times g \times g^2 \times g^4$ g^8
- e) $x^2 \times x^3 \times x^4 \times x^5$ x^{14}

4) Simplify the following

- a) $3x^2 \times 2x^3$ **6** x^5
- b) $5x \times 4x^2$ 20x³
- c) $6y^3 \times 2y^4$ $12y^7$
- d) $9x^2 \times x^3$ $9x^5$
- e) $4x^3 \times 2x \times 3x^2$ $24x^6$

5) Simplify the following

- a) $3x^2y^3 \times 2x^3y^4$ $6x^5y^7$
- b) $2xy^4 \times 3x^2y$ $6x^3y^5$
- c) $5x^3y^4 \times 2x^2y^2$ $10x^5y^6$
- d) $2x^2y \times x^4y^2$ $2x^6y^3$
- e) $3x^3y \times 2xy^2 \times 3x^2y^2$ $18x^6y^6$

Algebraic Simplification Division Answers

Simplify the following 1)

a)	$X^8 \div X^2$	X ⁶
b)	9 <i>y</i> ⁶ ÷ 3 <i>y</i> ²	3 <i>y</i> ⁴
c)	$14y^{3} \div 2y^{2}$	7 <i>y</i>
d)	20 <i>x</i> ⁵ ÷ 4 <i>x</i>	5 <i>x</i> ⁴
e)	$16x^{8} \div 8x^{2}$	2 <i>x</i> ⁶

Simplify the following 2)

Simplify the following			
a)	$\frac{12x^6}{3x^2}$	4 <i>x</i> ⁴	
b)	$\frac{20x^3}{2x}$	10 <i>x</i> ²	
C)	$\frac{5x^4}{x^2}$	5 <i>x</i> ²	
d)	$\frac{6x^5}{3x^3}$	2 <i>x</i> ²	
e)	$\frac{300x^9}{40x^2}$	30 <i>x</i> ⁷	

3) Simplify the following

10*x*²

a)
$$\frac{12x^{3}y}{4x}$$
 $3x^{2}y$
b) $\frac{15x^{4}y^{3}}{3xy}$ $5x^{3}y^{2}$
c) $\frac{20x^{3}y^{5}}{4x^{2}y^{3}}$ $5xy^{2}$
d) $\frac{14x^{2}y^{2}}{7xy}$ $2xy$
e) $\frac{30x^{2}y^{3}z^{6}}{3xy^{2}z^{4}}$ $10xyz^{2}$
Find the value of

4⁰ a) 1 **6**⁰ b) 1 c) 12° 1 d) Z^0 1 **X**⁰ e) 1

4)
Expanding Brackets

Answers

- 1) Expand
 - a) 2(x+3) 2x+6
 - b) 2(x-4) 2x-8
 - c) 5(2x+1) 10x+5
 - d) 7(3x-1) 21x-7
 - e) 4(2*a* + 7) 8*a* + 28
- 2) Expand
 - a) 2x(3x+1) $6x^2 + 2x$
 - b) 3x(4x-2) $12x^2-6x$
 - c) 2x(x+1) $2x^2 + 2x$
 - d) $3x(2x y) \quad 6x^2 3xy$
 - e) 5x(3x+2y) $15x^2 + 10xy$

3) Expand and simplify

- a) 2(x+3) + 4(x+1) 6x + 10
- b) 3(2x+1) + 2(5x+2) + 16x + 7
- c) 4(x+1) + 3(3x+4) 13x + 16
- d) 6(2x+3) + 5(x+2) 17x + 28
- e) 4(3x+2) + 5(2x+1) 22x + 13

4) Expand and simplify

- a) 2(5x+3) + 3(x-1) 13x + 3
- b) $3(4x+5) + 2(3x-4) \quad 18x+7$
- c) 5(2x-1) + 3(2x+5) + 16x + 10
- d) $2(3x-4) + 3(x+2) \quad 9x-2$
- e) 3(2x-1) + 4(3x-2) 18x 11

5) Expand and simplify

- a) 3(x+2) 2(x+3) x
- b) 4(2x+3) 3(2x+1) + 2x+9
- c) 5(3x-2) 2(x-2) 13x 6
- d) 2(5x-1) 4(2x-3) 2x + 10
- e) 3(2x+7) 2(3x+2) 17

Factorisation

Answers

- 1) Factorise the following
 - a) 6x-2 2(3x-1)
 - b) 8x + 14 2(4x + 7)
 - c) 6x + 9 3(2x + 3)
 - d) 10x 5 5(2x 1)
 - e) $12x + 18 \quad 6(2x + 3)$
- 2) Factorise the following
 - a) $x^2 + x$ x(x + 1)
 - b) $t^2 t$ t(t-1)
 - c) $x^3 + x$ $x(x^2 + 1)$
 - d) $x^5 x^2$ $x^2(x^3 1)$
 - e) $a^7 + a^4$ $a^4(a^3 + 1)$
- 3) Factorise the following
 - a) $3x^2 + 6x \quad 3x(x+2)$
 - b) $8x^3 2x \quad 2x(4x^2 1)$
 - c) $12a^2 + 4a^3 4a^2(3 + a)$
 - d) $20x^4 6x^2 \quad 2x^2(10x^2 3)$
 - e) $7x^3 + 8x \quad x(7x^2 + 8)$

- 4) Factorise the following
 - a) $6x^2y^4 + 4xy^3$ $2xy^3(3xy + 2)$
 - b) $4x^3y^4 + 2x^2y^2$ $2x^2y^2(2xy^2 + 1)$
 - c) $10x^4y^3z 5xy^5z$ $5xy^3z(2x^3 y^2)$
 - d) $16a^2b^3c^4 + 3ab^2c^3$ $ab^2c^3(16abc + 3)$
 - e) $9x^2y^4z 6xy^2z$ $3xy^2z(3xy^2 2)$
- 5) Factorise the following
 - a) 10x + 4 2(5x + 2)
 - b) $x^4 x^2$ $x^2(x^2 1)$
 - c) $9x^5 12x^2$ $3x^2(3x^3 4)$
 - d) $12x^2y^3 + 4xy^2$ $4xy^2(3xy + 1)$
 - e) $24x^3yz^4 10xz^2$ $2xz^2(12x^2yz^2 5)$

A10 Substitution Answers

1) Using
$$a = 3$$
, work out

a)	a + 5	8	d)	2 <i>a</i> + 1	7
b)	7 – a	4	e)	13 – <u>a</u> 3	12
c)	6 <i>a</i>	18	f)	<i>a</i> ² + 2 <i>a</i> – 20	-5

2) Using
$$x = 5$$
 and $y = 2$, work out
a) $x - y$ 3 d) $5y - 5x$ -15
b) $y - x$ -3 e) $x^2 + 3y$ 31
c) $3x + 2y$ 19 f) $\frac{4x}{y} - xy$ 0

3) Using a = 3, b = 1 and c = -2, work out

a)	a+b+c 2	C	d)	ab – c	5
b)	2b+c 0	e	e)	ac + 5b	-1
c)	<i>c-a</i> +b -4	f f)	c² – 2ab	-2

- 4) Using x = 3, work out
 - a) $x^2 2x$ 3
 - b) 2*x*² + *x* + 1 **22**
 - c) $x^3 2x^2 5$ 4
- 5) If $\pi = 3.142$ and r = 9, work out
 - a) 2π*r* **56.556**
 - b) π*r*² **254.502**

Sequences A11a Term-to-Term Rule *Answers*

- 1) Write the first five terms of each sequence
 - a) Start at 1 and add 5 1, 6, 11, 16, 21
 - b) Start at 30 and subtract 4 30, 26, 22, 18, 14
 - c) Start at 11 and add 9 11, 20, 29, 38, 47
- d) Start at 8 and subtract 4 8, 4, 0, -4, -8
- e) Start at -10 and add 6 -10, -4, 2, 8, 14
- f) Start at 4 and subtract 3 4, 1, -2, -5, -8
- 2) For each sequence, describe the rule and find the next two terms
 - a) 5, 7, 9, 11, <u>13</u>, <u>15</u> Add 2
 - b) 11, 16, 21, 26, <u>31</u>, <u>36</u> Add 5
 - c) 22, 19, 16, 13, <u>10</u>, <u>7</u> Subtract 3
- d) -1, 2, 5, 8, <u>11</u>, <u>14</u> Add 3
- e) 6, 2, -2, -6, <u>-10</u>, <u>-14</u> Subtract 4
- f) -42, -35, -28, -21, <u>-14</u>, <u>-7</u> Add 7
- 3) Here is a pattern made up of sticks



- a) Write the pattern as a number sequence.5, 9, 13
- b) Describe the rule. Add 4
- c) Find the next five terms of the sequence. **17, 21, 25, 29, 33**

Sequences A11b Position-to-Term Rule Answers

For each sequence, find the first 5 terms and the 10th term.

a)	3 <i>n</i> – 1	2, 5, 8, 11, 14,, 29
b)	n + 2	3, 4, 5, 6, 7,, 12
c)	5n + 2	7, 12, 17, 22, 27,, 52
d)	4n – 7	-3, 1, 5, 9, 13,, 33
e)	10 <i>n</i> + 9	19, 29, 39, 49, 59,, 109



 For each of the three grids below, write down the ratio of shaded squares to unshaded squares. Simplify the ratios if possible.



2) Shade in squares for each grid to give the correct ratios.



3) The instructions on a lemon squash bottle are as follows:

1 part squash to 4 parts water

- a) If you put 20 ml of squash in a glass, how much water would you need? 80 ml
- b) If you had used 200 ml of water, how much squash should be in the drink? 50 ml
- c) If you want to make 500 ml of squash drink, 100 ml squash how much squash should be used and how 400 ml water much water?

Introduction to Ratio Real-Life Contexts Answers

1) Here we have a fine example of a Vesuvian and a Dragian.
If you count carefully you can see that the ratio of teeth is 5 : 7
a) What is the ratio of feet? 6 : 2, 3 : 1
b) What is the ratio of eyes? 4 : 1
c) What is the ratio of fingers? 6 : 6, 1 : 1 *Check that you have given all ratios in the simplest form.*



R1a

- 2) Look at this picture of Vesuvians and Dragians and work out the following:
 - a) The ratio of Vesuvians to Dragians. 12:8, 3:2
 - b) The ratio of Vesuvian feet in the picture to Dragian feet in the picture. 72 : 16, 9 : 2
 - c) The ratio of Vesuvian eyes in the picture to Dragian eyes in the picture. 48:8, 6:1
- In another picture of Vesuvians and Dragians we only know two things:

Firstly, there are more Vesuvians than Dragians. Secondly, there are 46 teeth altogether in the picture.

Work out how many Vesuvians and Dragians there are in the picture. 5 Vesuvians 3 Dragians



Unit Conversions Answers

- 1) a) How many grams are in 3 kg? 3000
 - b) How many grams are in 4.5 kg? 4500
 - c) Convert 2 kg to g. 2000 g

R2

- d) Convert 6000 g to kg. 6 kg
- e) How many kg is 1500 g? 1.5 kg
- 2) a) How many millilitres are in 9 litres? 9000
 - b) How many litres is 7000 ml? 7
 - c) Convert 3400 ml to L. 3.4 L
 - d) Convert 8L to ml. 8000 ml
 - e) How many ml are in 7.3 L? 7300
- 3) a) How many cm are in 3 m? 300
 - b) How many mm are in 11 centimetres? 110
 - c) Convert 400 cm to m. 4 m
 - d) Convert 3 km to m. 3000 m
 - e) How many mm are in 5 m? 5000
 - f) Convert 9600 mm to m. 9.6 m

Expressing Quantities as Fractions *Answers*

 $\frac{3}{5}$

- There are 25 apples in a bag.
 15 of them are red.
 What fraction of the apples are red?
 Give your answer in its simplest form.
- 2) Fishfingers are sold in packets that say 'minimum 10' on them.

Here is the number of fishfingers in each of 12 packets.

What fraction of the packets have more than 10 fishfingers? Give your answer in its simplest form. $\frac{1}{4}$

- 3) 6 litres of pink paint can be made by mixing 1.5 litres of red paint with the correct amount of white paint.
 - a) How much white paint is needed? 4.5 litres
 - b) What fraction of the pink paint was white paint? Give your answer in its simplest form. $\frac{3}{4}$
- 4) Two thirds of the students in a class have a pencil.14 students have a pencil.How many students are in the class? 21

Unit Pricing Answers

- A bag of six apples cost £1.08
 What is the price per unit? £0.18
- 2) a) A pack of 40 teabags costs £1.20What is the price per unit? £0.03
 - b) A pack of 50 teabags costs £2.00What is the price per unit? £0.04
 - c) Which pack offers better value for money? 40 teabags

A calculator can be used for this question.

3) Julie wants to buy 24 yoghurts.

The shop sells them in two pack sizes.

There is a 12-pack at £3.90

There is an 8-pack at £3 or you can buy two 8-packs for £4.

- a) What is the cheapest way for Julie to buy
 24 yoghurts and what will the price be? Three 8-packs for £7
- b) What is the price per unit, to the nearest penny if Julie buys the yoghurts in the cheapest way? 29p



- 2) Write the following ratios in their simplest form:
 - a) 8:12 2:3
 - b) 6:10 3:5
 - c) 15:10 3:2
 - d) 16:4 4:1
 - e) 18:16 9:8
 - f) 25:15 5:3
 - g) 45 : 15 <mark>3 : 1</mark>
 - h) 18:27 2:3
 - i) 24:30 4:5
 - j) 36:48 <mark>3:4</mark>

- 3) Find the missing numbers in these ratios:
 - a) 1:4 = 2:8b) 1:5 = 6:30c) 2:7 = 8:28d) 5:4 = 15:12e) 2:3 = 8:28f) 9:5 = 63:35g) 3:5 = 18:30

	Ratios - Sha	aring
	K5D Answer	s
1)	Share out £20 between Bill and Sue in the ratio 3:2.	Bill gets £12, Sue gets £8
2)	Divide £60 between Jack and Jill in the ratio 7:3.	Jack gets £42, Jill gets £18
3)	Debbie and Dave share 200 Smarties in the ratio 1:4. How many Smarties do they each get?	Debbie gets 40, Dave gets 160
4)	Alec, Tony and Sara share £720 in the ratio 1:2:3. How much do they each get?	Alec £120, Tony £240 Sara £360
5)	If Dave and Sue share £30 in the ratio 2:3, how much more than Dave does Sue get?	£6 more
6)	Divide £12 between Mick and Sharon in the ratio 5:3.	Mick £7.50, Sharon £4.50
7)	Pete and Sandra work part-time in a restaurant. They share the tips in the ratio 3:5. If Pete gets £30 at the end of the week, how much will Sandra get?	£50
8)	Vicky and John share some sweets in the ratio 2:7. If Vicky ends up with 12 sweets, how many will John have?	42 sweets
9)	Len makes some concrete by mixing cement, sand and gravel in the ratio 1:4:3. If he uses 8 bags of sand, how many bags of cement and gravel will he use?	2 of cement and 6 of gravel
10)	An old television has a width and heigh in the ratio 4:3. If the width is 48 cm, what is the height?	it 36 cm



- 2) Two numbers are in the ratio 7 : 3.
 If you take one of the numbers away from the other one you get an answer of 24.
 What are the two numbers? 42 and 18
- 3) In a class of 30 pupils the ratio of boys to girls is 2 : 3.
 If 6 girls (but no boys) join the class what is the new ratio of boys to girls? 1 : 2
- 4) Sue, Ted and Ben all have their birthday on the 1st January.
 In 2010, Sue, Ted and Ben have ages in the ratio 2 : 3 : 4.
 - a) If Ted is 15 years old, how old Sue is 10, are Sue and Ben? Ben is 20
 - b) When Sue, Ted and Ben are all five years older, what will be the ratio of their ages? Write the answer in its simplest form. 3:4:5
 - c) In which year was the ratio of Sue, Ted and Ben's age 1:2:3? 2005
 - d) How old was Ben when the ratio of the three ages was 1 : 3 : 5? 12.5
 - e) On what date was the ratio of Sue and Ben's age 1 : 41? 1st April 2000



- 1) How many sides does a pentagon have? 5
- 2) Give the two names for a 7-sided polygon <u>Septagon</u> and <u>Heptagon</u>
- 3) Match the shapes to the names



4) Give two reasons why this diagram does not show a polygon.





1) Which of these shapes are prisms? Tick them.



2) Write the names of these shapes.









- 3) a) A prism has 5 faces, 9 edges and 6 vertices.What is its name? Triangular prism
 - b) A pyramid has 4 faces, 6 edges and 4 vertices.What shape must its base be? A triangle









Cube





Octahedron





Shapes put together to make a tetrahedron





1) Work out the size of angles *a* to *h*.





1) Write down the names of the quadrilaterals a) to g)



2) Fill in the table for quadrilaterals A, B and C.

Shape	Number of lines of symmetry	Order of rotational symmetry	Area
А	None	2	112 cm ²
В	None	None	90 cm ²
С	2	2	80 cm ²





G16 Properties of Special Triangles Answers

1) Write the special name for each type of triangle next to it and fill in the gaps in the description.



2) Find the missing angles.





1) Work out the size of the missing angles.



2) Work out the size of the missing angles.





3) Work out the size of the missing angles.

24







- Find the sum of the interior angles of a nonagon (a 9-sided shape).
 1260°
- 2) Find the sum of the interior angles of a 14-sided shape. 2160°
- 3) The sum of the interior angles of a polygon is 1620°.How many sides does it have? 11
- 4) Here is a regular decagon.



- a) What is the sum of the interior angles? 1440°
- b) Find the size of one interior angle. 144°
- c) Find the size of one exterior angle. 36°
- 5) A regular polygon has interior angles of size 135°.
 - a) How many sides does it have? 8
 - b) What is its name? Octagon





1) Find the area of the shaded section.

rectangle =

42 cm²



7 cm



10 cm

3 cm

15 cm

Area of this

rectangle = 45 cm^2

shape = 87 cm²



1) Find the areas of the five parallelograms on this cm square grid.







2) Find the areas of the following shaded parts of rectangles



 The two squares are drawn on 1 cm square grids. Find the areas of the squares.





1) Find the area of the following trapeziums:



Work out an exact probability (as a fraction) for these events:

- a) If you flip a coin you will get a 'head'. $\frac{1}{2}$
- b) If you flip two coins you will get two 'heads'. $\frac{1}{4}$

Outcomes - Basics

Answers

- c) If you roll a dice you will get a 6. $\frac{1}{6}$
- d) If you roll two dice you will get two 6's. $\frac{1}{36}$
- e) If you flip a coin and roll a dice you will get $\frac{1}{12}$ a 'head' and a 6.
- f) If you flip three coins you will get three 'heads'. $\frac{1}{8}$
- g) If you flip three coins you will get two 'heads' $\frac{3}{8}$ and a tail in any order.
- h) If you flip three coins you will get at least $\frac{7}{8}$ one 'head'.
- i) If you roll two dice and add the scores $\frac{3}{36}$ together you will get a total of 4.



1) A counter is taken at random from set 1 followed by another counter at random from set 2.



- a) Write down all the possible pairs of counters that may be chosen. 2A 2B 2C 2D
- b) What is the probability that 3B will be picked? $\frac{1}{12}$
- c) What is the probability that any pair of counters will be chosen **except** 3B? $\frac{11}{12}$
- d) What is the probability that the pair of counters chosen will include an odd number? $\frac{8}{12}$
- 2) The two spinners on the right are spun and their scores added together to give a total.
 - a) Draw a possibility space to show all the totals.

6	7	8	9	10
5	6	7	8	9
4	5	6	7	8
3	4	5	6	7
	1	2	3	4



1A 1B

1D

1**C**

3A 3B 3C 3D

b) What is the probability of scoring a total which is bigger than 5? 13/16

Mutually Exclusive Events

Answers

0.24

 Every Tuesday the main school dinner is either Sausages, Chicken, Pizza or Tuna.

Use the table below to work out the probability that 0.18 the main dinner will be Pizza next Tuesday. 0.47 0.89

1 – 0.89 = **0.11**

School dinner	Sausages	Chicken	Pizza	Tuna
Probability	0.24	0.18	? 0.11	0.47

2) Every Wednesday the main school dinner is either Sausages, Chicken, Pizza or Tuna.

The probability of it being Sausages is exactly the same as the probability it will be Tuna.

Use the table below to work out the value of the probability x.

School dinner	Sausages	Chicken	Pizza	Tuna	
Probability	x	0.41	0.35	x	
0.12			-	0.12	
0.41 <u>0.35</u>			1 - 0.76 = 0.24		
		0.76 ($0.24 \div 2 = 0.12$		




- 1) a) In this group of seven people, which one has the median average height? Tom
 - b) What are the names of the people who are below the median average height? Tim, Sue and Ben
 - c) To find the range of the heights you would need to measure the height of two people.
 Which two? Kim and Tim
- 2) A class of students were asked how many pets they own.

The answers were as follows:

- 1, 0, 1, 2, 1, 5, 2, 0, 1, 2, 3, 1, 4
- 2, 3, 1, 2, 2, 0, 1, 1, 2, 1, 3, 2
- a) Find the median average number of pets per student. 2
- b) Which number of pets is the mode? 1
- c) What is the range of the answers? 5 (5-0)
- Twenty children were asked what their favourite colour was. Their answers were:

Blue, Red, Yellow, Red, Green, Red, Green, Blue, Red, Blue Green, Blue, Red, Blue, Yellow, Red, Blue, Orange, Red, Red

- a) Which colour is the modal average? Red
- b) Why can't we find the median colour? The median can only be used with numerical values.



- The heights of 18 plants, to the nearest cm, are as follows:
 15, 19, 16, 12, 13, 15, 20, 18, 16, 14, 12, 18, 16, 16, 17, 15, 15, 15
 - a) Find the modal height of the plants. 15 cm
 - b) Find the median height of the plants. 15.5 cm
 - c) Find the range of the heights. 8 cm
- You are told that the median score on these four cards is 9.5

Work out what the number is on the bottom card. 11





 We have six cards with numbers on them and we know the following: the modal average is 3 the median average is 5 the range is 11 Work out the numbers on the other four cards.

4)	C	relle e dies 22 times and rute her	Score	Frequency		
4)	SUE	pres into a table.	1	2		
	a)	What is Sue's modal score? 6	2	3		
	b)	What is Sue's median score? 4	3	3		
	c)	What is the range of Sue's scores? 5	4	4		
			5	4		
			6	7		



- a) Move blocks around so that the heights of the five towers are the same.
 - b) What is the mean average number of blocks in each tower? 4
- 2) a) Move blocks around so that the heights of the four towers are the same (you may have to cut some blocks).
 - b) What is the mean average number of blocks in each tower? 3.5



- 3) In a spelling test, the results for the class (out of 10) are:
 - 3, 6, 8, 8, 4, 1, 7, 6, 2, 9, 3, 8, 4, 1, 1, 3, 5 and 2
 - a) Work out the mean average score for the class. 4.5
 - b) How many children had a score below the mean average? 10
- Two Year 6 classes had a 'times table test' which was marked out of 20.

The marks in David's class were:

14, 12, 19, 20, 20, 15, 14, 12, 13, 3, 18, 19, 16, 14, 12, 6

Harry was in the other class and the marks were:

9, 12, 17, 17, 16, 14, 18, 20, 8, 13, 16, 14, 18, 8

Use the mean average to work out which class did better in the test. Mean average for David's class: 14.1875 Mean average for Harry's class: 14.28571 Harry's class did best.

The Mean Average

Answers

- 7 8 2
 - If the mean average number on these five cards is 6, what is the number on the bottom card?



2) If the mean average number on these eight cards is 4.25, what is the number on the bottom card? 3

3) John rolled a dice thirty times and put the results into this table.

Score	Frequency					
1	4					
2	3					
3	5					
4	6					
5	4					
6	8					
Work out his mean average score.						

3.9

- 4) What is the mean average number of arms per person in Britain? 1.999....
 Very close to 2 but definitely not quite 2
- 5) Can you find out the mean number of children per family in the UK?
 Widely reported as 1.8

Scatter Diagrams Answers

1) The heights and weights of some children are shown in the table, below.

Height (cm)	132	145	150	140	175	168	177	162	170	162	165	149	150	135	159	160
Weight (kg)	34	40	43	35	60	54	62	51	57	51	58	40	41	33	44	50



2) The scatter graph below relates car engine sizes to their fuel consumption in mpg.



- a) Describe the correlation shown by the data. Negative correlation
- b) A car has an mpg of 25.
 Estimate the engine size.
 2 litres

Your answer will depend on your line of best fit which you must have drawn.



city

Over 30 miles from the city

 1) The table on the right shows how far 90 visitors to a museum have travelled. Draw a pie chart to show this information.
 Within the city Within 30 miles of the

Distance	Frequency					
Within the city	13 × 4 = 52 °					
Within 30 miles of the city	9 × 4 = 36 °					
Over 30 miles from the city	20 × 4 = 80°					
Overseas	<u>48</u> × 4 = 192° 90					
360° ÷ 90 = 4 °						

2) The table shows the land usage of a farm. Draw a pie chart to show this information.

Overseas

