✓ LAST Q ?✓

City of London School for Girls

YEAR 7 ENTRANCE EXAMINATION

MATHEMATICS

Sample Questions

First Name: .....

Surname: .....

Instructions:

- Do write in pencil
- Do try all the questions
- If you cannot answer a question, go on to the next one.
- Do write your working out in the space near each question
- Do not erase your working out as you may get marks for it
- Calculators and rulers are NOT allowed

1) Calculate 3056 + 1962

$$\begin{array}{r} 3056 \\ +\ 1962 \\ \hline 5018 \end{array}$$

Answer: 5018

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2) Calculate 3056 − 1962

$$\begin{array}{r} {}^{2}\cancel{3}\,{}^{1}\cancel{0}\,{}^{1}56 \\ -\ 1962 \\ \hline 1094 \end{array}$$

Answer: 1094

---

3) Calculate 3086 × 7

$$\begin{array}{r} 3086 \\ \times\quad 7 \\ \hline {}^{2}1\,{}^{1}6\,0\,2 \end{array}$$

Answer: 21,602

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4) Calculate 3056 ÷ 4

$$\begin{array}{r} 764 \\ \hline 4\,\overline{)\,3\,0\,{}^{2}5\,{}^{1}6} \end{array}$$

Answer: 764

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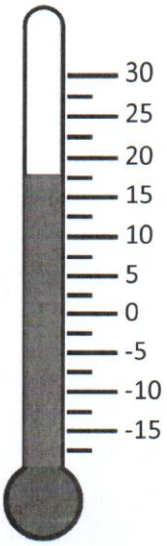
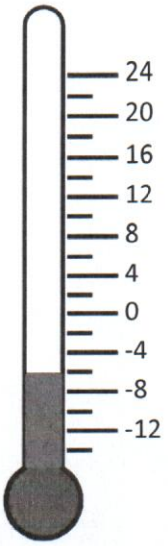
5) Write down the temperatures shown by these thermometers



17.5 °C



-6 °C

BIDMAS

6) Evaluate the following:

a. $4 + 3 \times 7$

$7 \times 3 = 21$
$21 + 4 = 25$

Answer: 25

b. $24 \div 6 + 2$

$24 \div 6 = 4$
$4 + 2 = 6$

Answer: 6

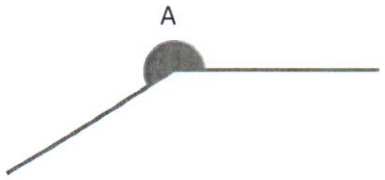
c. $18 \div 2 \times 3$

$18 \div 2 = 9$
$9 \times 3 = 27$

Answer: 27

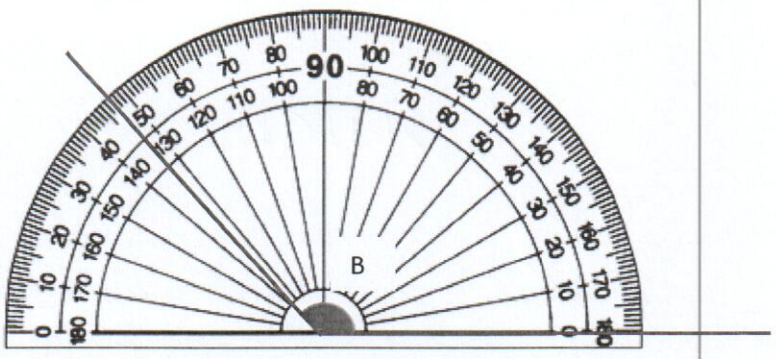
7) Look at the following two angles.

a. What type of angle is angle A?



Answer: OBTUSE

b. What is the value of angle B?



Answer: 133°

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8) What number is fifty-seven less than one-thousand-and-twenty?

$$\begin{array}{r} {}^{0}\cancel{1}{}^{9}\cancel{0}{}^{11}2{}^{1}0 \\ -\quad 5\,7 \\ \hline 9\,6\,3 \end{array}$$

Answer: 963

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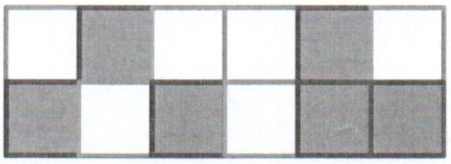
9) Write down the number represented by MCCCXIV

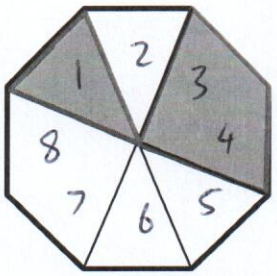
M = 1000
C = 100
X = 10
IV = 4

Answer: 1314

10) What fractions of these shapes are shaded?

a. 

Answer: 1/2

b. 

Answer: 3/8

11) Round 39607 to:

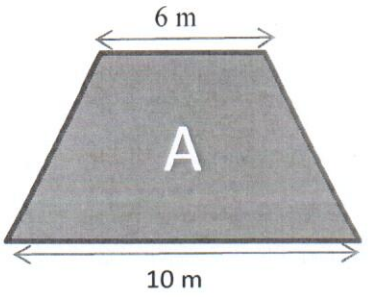
a. the nearest 100

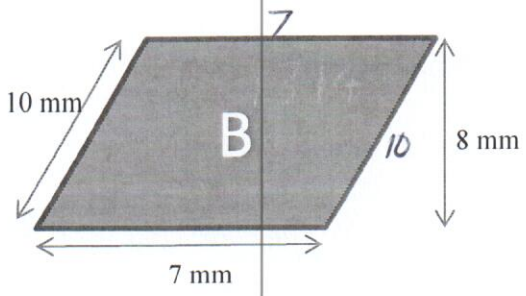
Answer: 39600

b. the nearest 1000

Answer: 40,000

12) Here are two shapes:





a. Name shape A

Answer: TRAPEZIUM

b. Find the perimeter of shape B

$10 + 10 + 7 + 7$

$= 20 + 14$

$= 34$

Answer: 34mm

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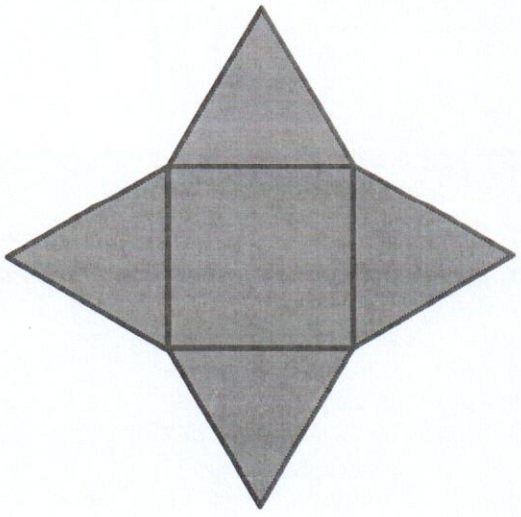
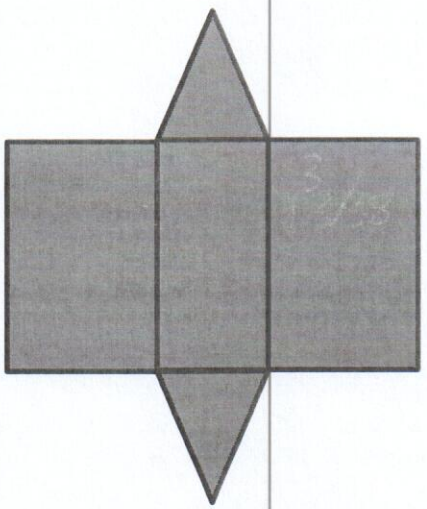
13) Identify the following shapes from their nets



Answer: PYRAMID



Answer: PRISM

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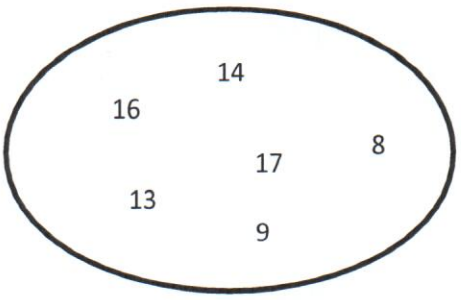
14) Here are some numbers:



a. Write down all of the numbers which are prime

Answer: 13 and 17

b. Write down all of the numbers which are square numbers

Answer: 9 and 16

c. Write down all of the numbers which are multiples of 7

Answer: 14

d. Write down all of the numbers which are cube numbers

Answer: 8

---

15) Write the following numbers in order from largest to smallest

0.415 0.401 0.45 0.045 0.4050

0.415 0.401 0.450 0.045 0.4050

Answer: 0.45, 0.415, 0.4050, 0.401, 0.045

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16) Complete the number sentence:

$12 \times 4 = \boxed{38} + 10 = 63 - \boxed{15}$

48

48-10

63-15 = 48

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17) What is $\frac{3}{4}$ of 130?

$$4 \overline{)130.00} = 32.5$$

12↓

10

8

20↓

0

Answer: 32 1/2

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18) Evaluate the following:

a. $\frac{1}{6}+\frac{1}{3}$

1/3 = 2/6

1/6 + 2/6 = 3/6

= 1/2

Answer: 1/2

b. $\frac{5}{6}-\frac{1}{9}$

15/18 - 2/18 = 13/18

common denom

Answer: 13/18

c. $5 \times \frac{3}{10}$

5 x 3 = 15

$\frac{15}{10} = 1\frac{1}{2}$

Answer: 1 1/2

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19) Party hats come in packs of eight. Elyse has 42 party hats.

a. Work out the exact value of $42 \div 8$

42 ÷ 8

5.25
8 | 42.000
40
20
16
40

Answer: 5.25

b. What is the smallest number of packs of party hats Elyse could have bought?

Answer: 6 packs

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20) A box of sweets costs £2.17. Charlotte buys three boxes of sweets with a £10 note. How much change does she receive?

217 × 3 = 651

10.00 − 6.51 = 3.49

Answer: £3.49

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21) The following table shows some temperatures recorded in several cities on 1st January 2016

City	London	Paris	Madrid	New York	Milan	Berlin
Temperature (°C)	3	2	5	-3	4	

a. How much warmer was it in Madrid than in New York?

−3 → 0 = 3
0 → 5 = 5
3+5 = 8

Answer: 8 °C

b. The temperature in Berlin was five degrees lower than London. What was the temperature in Berlin?

3 → 0 = 3
0 → −2 = 2
} 5 °C

Answer: −2 °C

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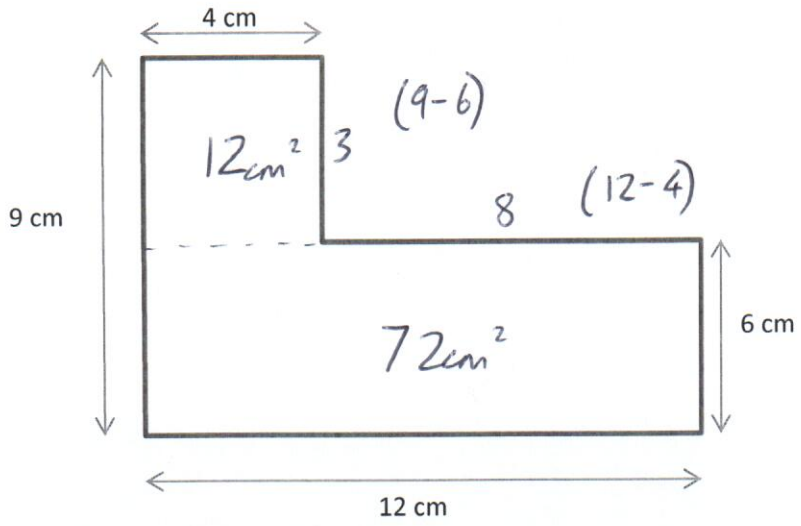
22) The shape below is made from two rectangles. Find the perimeter of the shape.



9
4 13
3 16
8 24
6 30
12
42

Answer: 42 cm

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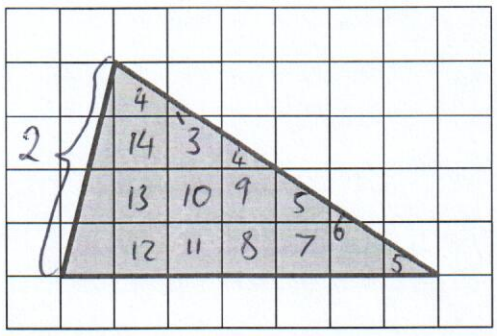
23) Find the area of the triangle.
(1 square is worth $1cm^2$).



Answer: $14 cm^2$

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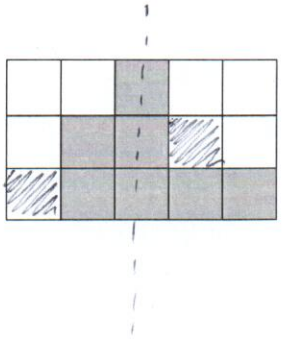
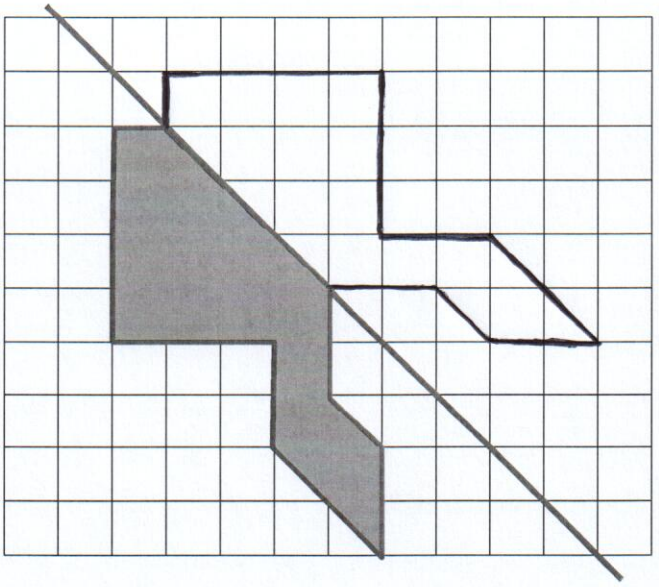
24) Shade in **three squares** so that the following shape has exactly **one line of symmetry.**



25) Reflect the shaded shape in the mirror line



26) One pint is the same as approximately 570ml.

How many pints are approximately the same as 4 litres?

Circle the closest answer

570
× 7
3990 ml ~ 4 L

Answer: 5 pints 6 pints (7 pints) 8 pints

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27) The following diagram shows part of a train timetable

Hastings	0730	0742	0755	0807
St Leonards	0738	-	0803	0815
Crowhurst	0744	-	0809	0821
Battle	0751	0759	0816	0828
Robertsbridge	0756	0805	0821	0833
Etchingham	0802	0812	-	0839
Stonegate	0806	0816	0830	0843

a. How long does it take the 07:42 train from Hastings to get to Battle?

07:42
07:59 = 17 mins

Answer: 17 mins

b. Jessica arrives at Crowhurst at quarter-to-eight. How long must she wait for a train to Etchingham?

07:45 (Crow)
08:21

= 15 + 21 = 36

Answer: 36 mins

c. Which is the latest train I can catch at Hastings to make sure I get to Robertsbridge by half past 8?

Answer: 07:55

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28) Annie and Bea find a lizard that is exactly 5 inches long.

Annie says that 2.54cm is the same as one inch.

a. How long, in centimetres, does Annie think the lizard is?

$$\begin{array}{r} 2\cdot54 \\ \times\quad 5 \\ \hline 12\cdot70 \end{array}$$

Answer: 12.7 cm

Bea says that the lizard is 12.5cm long.

b. How many centimetres does Bea think are the same as one inch?

$$5\overline{)12\cdot5} = 2\cdot5$$

$$\begin{array}{r} 10 \\ \hline 25 \\ 25 \\ \hline 0 \end{array}$$

Answer: 2.5 cm

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29) You are told that $18 \times 1285 = 23130$

Use this answer to work out the values of:

$$2\overline{)23130} = 11565$$

a. 9×1285

$$2\overline{)23130} = 11565$$

Answer: 11,565

b. 36×128.5

= double and ÷ 10

$$\begin{array}{r} 23130 \\ \times\quad 2 \\ \hline 46260 \end{array} = 46260$$

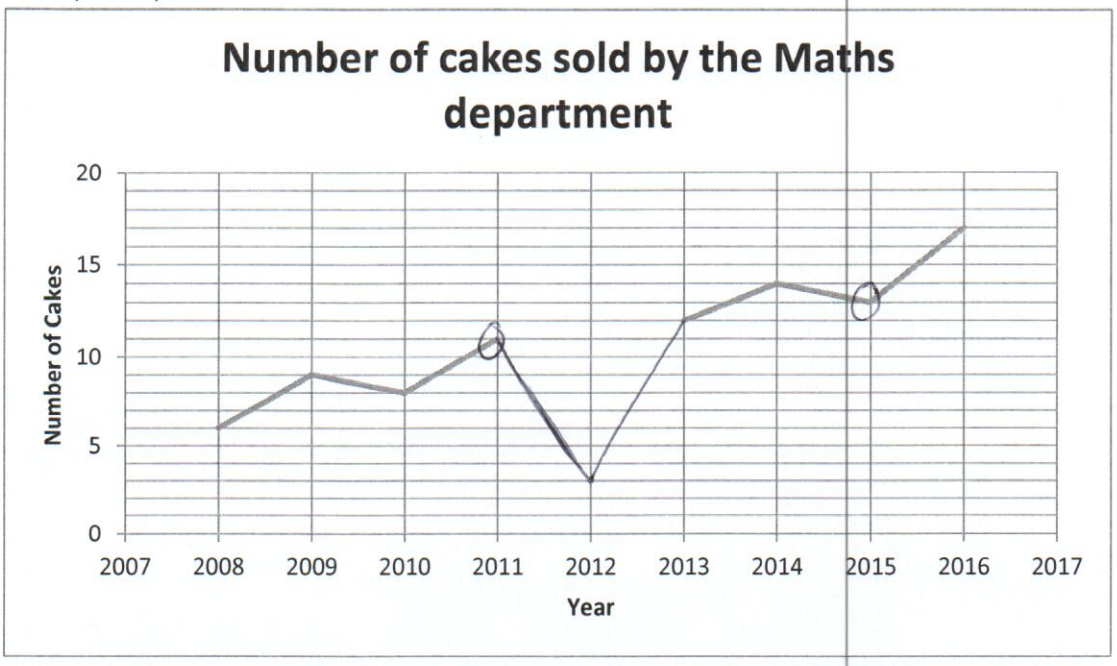
Answer: 4626

c. $46260 \div 360$

$= 128.5$ $(4626 \div 36)$

Answer: 128.5

30) Here is a graph showing how many cakes the Maths department sell to raise money for charity each year.



In 2012 The Maths department at CLSG forgot to ice their cakes and sold only three cakes!

a. Complete the graph

b. How many more cakes did the Maths department sell in 2015 than 2011?

13 - 11

Answer: 2 cakes

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31) Fill in the gaps in these sequences

a) 24, 12, 6, 3, 1½, ...

b) 7 8 10 14, 22, ...

c) 2.8, 3·6, 4.4, 5.2, 6·0, ...

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32) Put the following numbers in ascending order:

a. $\frac{3}{4}$ $\frac{8}{9}$ $\frac{2}{5}$ $\frac{3}{10}$

0.75 0.88 0.4 0.3

Answer: 3/10 , 2/5 , 3/4 , 8/9

b. $1\frac{1}{2}$ $\frac{5}{4}$ 1.6

1.5 1.25

Answer: 5/4 , 1 1/2 , 1.6

---

33) Annie spent 1/3 of her money on a new top and 2/3 of the remainder on a skirt.
She had £6 left.

How much did Annie spend altogether?

reverse

6 left

so the remainder of purchase 1 = 18

if, after spending 1/3 on a top and having £18 left,
she had £27 at the start

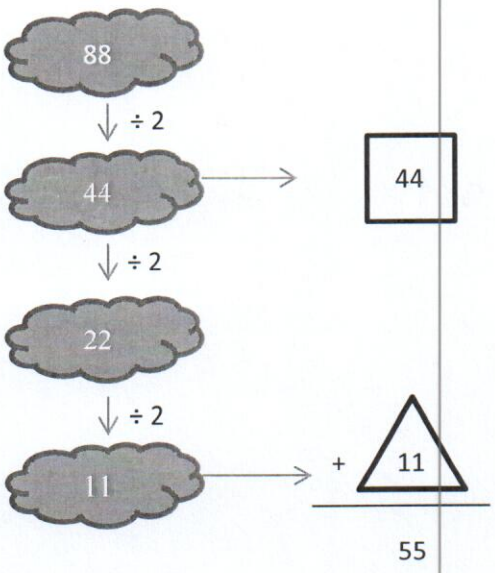
Answer: £27

34) To convert a distance from kilometres into miles you can use the following process:

i. Start with a number of kilometres
ii. Halve the number and write down your answer
iii. Halve the answer (don't write anything down)
iv. Halve the answer again and write down your answer
v. Add the two answers you've written down together.
vi. This is the number of miles.

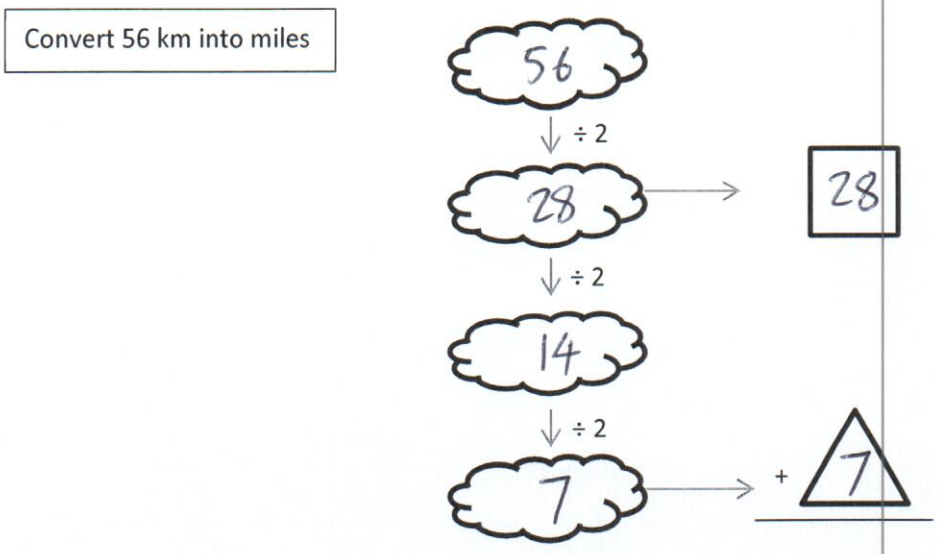
E.g.

Convert 88 km into miles



88 km is the same as 55 miles

a. Convert 56 kilometers into miles using the diagram below



Answer: 56 km is the same as 35 miles

b. What fraction of the original number is the number in the box?

56 → 28

Answer: 1/2

c. What fraction of the original number is the number in the triangle?

56 → 7

Answer: 1/8

d. What fraction of the original number is the final answer?

$\frac{35 \div 7}{56 \div 7} = \frac{5}{8}$

Answer: 5/8

35) A diagonal is a line joining two vertices (corners) of a shape that is not an edge of the shape.

a. Draw all of the diagonals on each shape. The first one has been done for you.

b. Complete the table

Shape	4	5	6	7
Number of diagonals	2	5	9	14
		+3	+4	+5

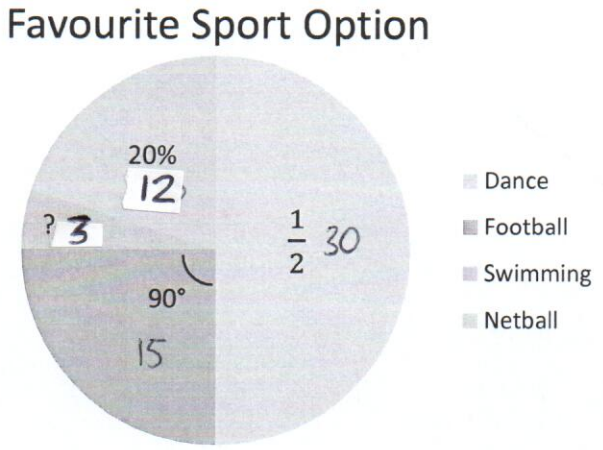
c. Use the pattern in the table to work out how many diagonals a ten-sided shape has.

8 9 10 no of sides.

+6 20 +7 27 +8 35 no of diagonals

Answer: 35 diagonals

36) This pie chart represents 60 pupils. What fraction of the pupils do swimming?



swimming
= 3 pupils of 60
3/60 = 1/20

Answer: 1/20

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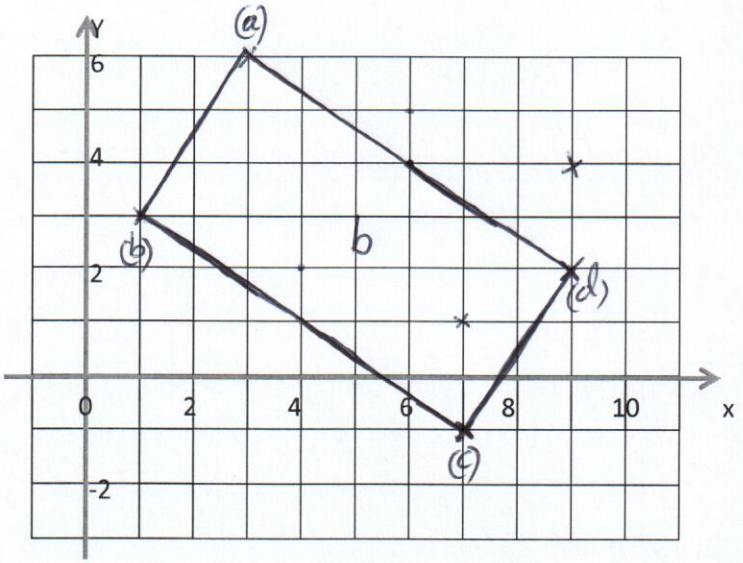
37) Three corners of a rectangle are at (3,6), (1,3) and (7,-1).

a. Plot the points (3,6), (1,3) and (7,-1) on the diagram below.
b. Draw the rectangle
c. What are the coordinates of the fourth corner of the rectangle?



Answer: (9, 2)

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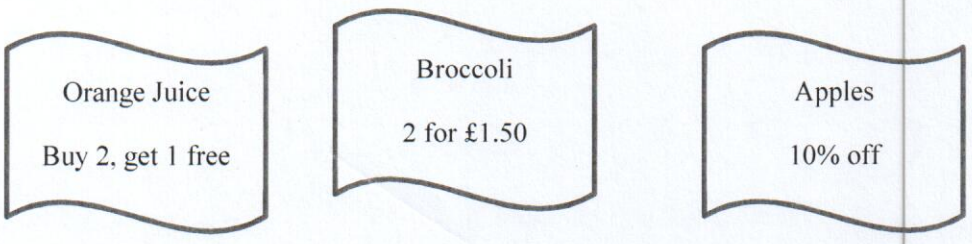
38) **You must show clear working for this question.**

Sarah goes to the shops to buy some food. Here is her shopping list and the prices of the food in the shop.

Some of the food is on special offer!



a. How much does Sarah spend on potatoes?

1·24 per kg
500g = ½ kilo

1·24 ÷ 2

= 62p

62
2|124

Answer: 62p

b. How much does Sarah spend on Broccoli?

4 = 2 × £1.50 = £3.00
(2 for £1.50)

Answer: £3.00

c. How much does Sarah spend on Apples?

she needs 7 apples
= £1.60
(10% off) £1.60 - 16p = £1.44
1.60 ÷ 10 = 16p

Answer: £1.44

d. How much does Sarah spend altogether?

£1.20 × 2 = £2.40

0.62
3.00
+ 1.44
2.40
1.23
8.69

Answer: £8.69

39) Two numbers have a sum of 11 and a product of 24. What is their difference?

$24 = 12 \times 2$

~~6×4~~

8×3

$8 - 3 = 5$

Answer: 5

C L S G

40) On Planet Ward, instead of pounds and pence, there are Clips, Lips, Sips and Glips.

Two Clip is worth three Lip $2C = 3L$

Two Lip is worth five Sip $2L = 5S$

Seven Sip are worth four Glip

$7S = 4G$

a. How many Sip are four Clip worth?

$4C = 6L$

$6L = 15S$

Answer: 15 Sip

b. How many Lip are 20 Glip worth?

$20G = 35S$

$\div 2$ $2L = 5S$

then $35S = 14L$

Answer: 14 Lip

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41) A Maths quiz has ten questions.
5 marks are added for a correct answer
1 mark is subtracted for an incorrect answer
0 marks are given for a question with no answer

a. If Poppy gets 6 answers correct, two answers incorrect and leaves out the last two questions, what is her score?

$6 \times 5 = 30$ $30 - 2 = 28$ marks
$2 \times 1 = 2$

Answer: 28 marks

b. If Alia did not answer three questions and scored 29, how many questions did she get correct? 10 Qs

3 unanswered
Answered 7, must have got 6 correct and 1 incorrect.

Answer: 6

c. If Tanya scored a total of 22 marks, how many questions did she

a) Answer correctly

T + E must have got 5 correct $5 \times 5 = 25$

Answer: 5 questions

b) Answer incorrectly

To get from 25 → 22, she must have answered 3 incorrectly

Answer: 3 questions

c) Not answer

$10 - 5 - 3 = 2$

Answer: 2 questions

42) Jess and Jill share some sweets.

Jill has six sweets for every five sweets Jess has.

Jill gives eight sweets to Jess.

Now, Jill has four sweets for every seven sweets Jess has.

How many sweets do the girls have altogether?

6 : 5

-8( ) +8

4 : 7

6 for every 5 ; so answer must be a multiple of 11

T + E

33 sweets

18 : 15

10 : 23

×

44

24 : 20

16 : 28

✓

Answer: 44 sweets

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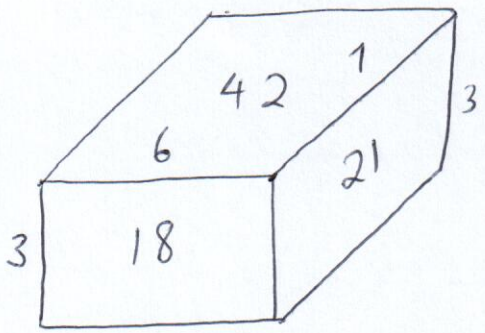
43) A cuboid has faces with areas of $18cm^2$, $21cm^2$ and $42cm^2$. What are the lengths of its sides?



? × ? = 18

? × ? = 21

? × ? = 42

common multiples are :

3, 6, 7

Answer: 3cm, 6cm, 7cm

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44) Clara has forgotten the passcode for her phone. She knows it contains the digits 0, 4 and 9 and that one digit is repeated. Clara guesses the passcode and receives the following information:

9004 – no digits correct
4009 – one digit correct
4409 – two digits correct
4990 – three digits correct

middle two cannot be 00
one of ends is correct (as it is repeated)
- either 4 or 9 correct

-4-- must be correct

What is her passcode?

if 3 correct, then -9-- is incorrect, as it is a 4

4490

Answer: 4490

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45) Frances writes down four whole numbers.

The average (mean) of her numbers is six.
The difference between the smallest and largest numbers is five.
The smallest number is four.
She did not write down the number 5.

What numbers did she write down?

→ average = 6, so total = 4 × 6 = 24
→ range = 5
→ smallest = (4), so, Largest = (9)
→ 4 + 9 = 13
24 - 13 = 11 (sum of other two)
→ 5 not written down
→ 4 is smallest, so there must be another (4), 11 - 4 = (7)

Answer: 4, 4, 7, 9

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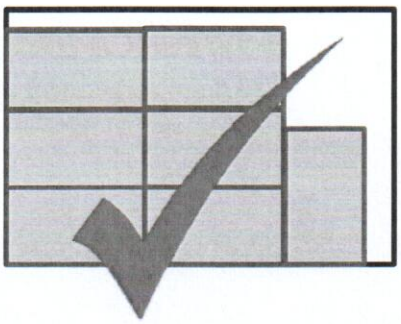
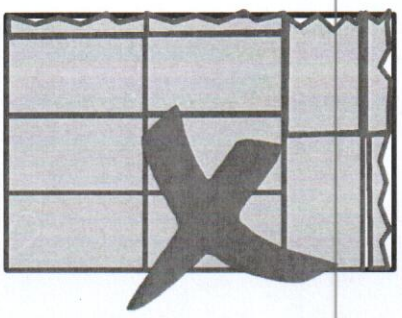
46) What is the largest number of 30cm by 10cm tiles can you fit in a space that is 1m wide and 2m long?

Breaking tiles and overlapping tiles is not allowed.





area of space

1m × 2m

= 100cm × 200cm = 20,000cm²

area of tile

= 30cm × 10cm = 300cm²

no of tiles

= 20,000 ÷ 300

200 ÷ 3

$$\begin{array}{r} 66 \\ 3\overline{)200} \\ -18\downarrow \\ \hline 20 \\ 18 \\ \hline 2 \end{array}$$

= 66 remainder 2

Answer: 66 tiles

47) In a magic square, the numbers in each row, each column and both diagonals must add to the same number.

a. Complete this magic square

4	9	2
3	5	7
8	1	6

$4+8=12$
$15-12=3$

$3+5=8$
$15-8=7$

$4+2=6$
$15-6=9$

$2+5=7$, $15-7=8$

$9+5=14$
$15-14=1$

$4+5+6=15$

b. Below is the same magic square. Put each of these expressions in the correct place on the magic square:

~~a^3~~ ~~$a+3$~~ ~~b^2~~ ~~$2\times(a+1)$~~ $= 2a+2$

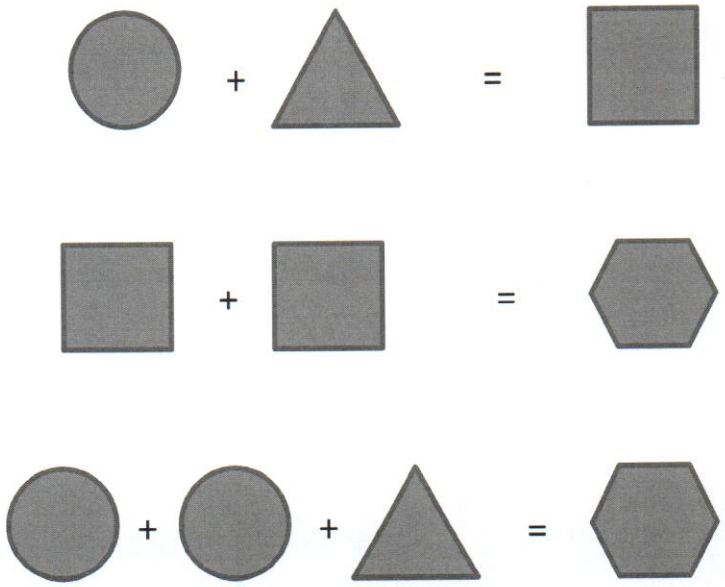
~~$b-a$~~ ~~$2\times a+b$~~ $b+\frac{1}{2}a$

$b+\frac{1}{2}a$	b^2	a
b	$a+3$	$2\times a+b$
a^3	$b-a$	$2a+2$ $(2\times(a+1))$

$a=2$
$b=3$ (FROM ABOVE)

Answer: .....

48) Each shape represents a number



What is the value of the triangle?

① □ + □ = ○ + ○ + △

both equations that equal a hexagon

② □ + □ = ○ + ○ + △ + △

each square equals a circle plus a triangle, so sub them in

③ ○ + ○ + △ + △ = ○ + ○ + △

cancel out anything that appears both sides

~~○~~ + ~~○~~ + ~~△~~ + △ = ~~○~~ + ~~○~~ + ~~△~~

④ △ = 0 (zero)

left with a triangle one side, and nothing the other.

Answer: △ = 0 zero.

End Of Questions (Total: 100 marks)