13+ Entrance Examination

Sample Paper

Mathematics - Non Calculator

Total Marks: 100

Time allowed: 1 hour

Notes: This paper is designed to reflect the difficulty of a Level 2 ISEB Maths paper.

2017 - Paper 1

Owl Tutors

1. Calculate the following:

a) The sum of -3 and 7

Answer: _____(1)

b) The product of -3 and 7

Answer: _____(1)

c) The difference between -3 and 7

Answer: _____(1)

d) The result of dividing -9 by 4

Answer: _____(2)

2.) a) Mike paid a total of £4.69 for a chocolate bar, a bag of crisps and a jar of jam.

The jar of jam cost £2.19. The chocolate bar cost 57 pence. How much did the bag of crisps cost?

Answer: _____ p (2)

b) What is the total cost of 30 pencils at 32p each?

Answer: _____ p (2)

c) Ben shares 344 chocolate drops between himself and three friends. How many chocolate drops does each person receive?

Answer: _____ p (2)

3.) a) Write each of the following numbers as the product of its prime factors

i) 36

Answer: _____(1)

i) 24

Answer: _____(1)

b) Write down the following… (You can use your answers to part a) if you want to. You don't have to!)

i) The smallest multiple of 36 and 24

Answer: _____(2)

i) The largest factor of both 36 and 24

Answer: _____(1)

4. i) James runs for 1 ½ hours. He runs at 12 miles per hour.

a) How far does James run?

Answer: _____ km (2)

After this, he runs 8 miles further at 10 miles per hour.

b) How long has James run for?

Answer: _____ hours, _____ minutes (2)

ii) Mohamed ran 42 km in 2 hours and 30 minutes. What was his average speed?

Answer: _____ km/h (3)

5.) An amount of money is split between Adam, Eve and Steve. Adam takes 15%. Eve gets ¼ of the total. Steve gets the rest.

    a) What fraction does Steve get?

Answer: _____ **(2)**

Eve gets £80.

    b) How much does Adam get?

Answer: £ _____ **(2)**

Adam spends 75% of his share on a video game.

c) How much has Adam spent?

Answer: £ _____ **(2)**

d) How much would Steve have to give Eve for them to have the same amount of cash?

Answer: £ _____ **(2)**

6. Mary and Sarah go to a pizzeria. Mary buys a Vegetarian pizza. Sarah buys a Pepperoni pizza. The pizzas are the same size.

They decide to share their pizza.

Mary takes ¼ of her Vegetarian pizza. Sarah takes ⅓ of the Vegetarian pizza.

a) What fraction of the Vegetarian pizza is taken?

Answer: _____ **(2)**

Sarah takes ⅓ of the Pepperoni pizza. Mary takes ⅖ of the Pepperoni pizza.

b) What fraction of the Pepperoni pizza is left over?

Answer: _____ **(3)**

For pudding, Mary and Sarah share 72 jelly babies. Mary has 42 of them.

c) Write the ratio of the jelly babies eaten by Mary and Sarah, in it's simplest form.

Answer: _____ : _____ **(2)**

7. Sally plays cricket for a season. She gets the following amount of runs in each game:

63, 56, 41, 14, 92, 7, 25 and 14

    a) What is Sally's average score per game?

Answer: _____ **(2)**

Trevor scores 256 runs in the same season, playing 8 games. He scores 25% of them in one game.

    b) How many runs does Trevor score in the other 7 games?

Answer: _____ **(2)**

8.

   a) Construct a triangle ABC. AB = 12 cm, AC = 9 cm. Angle BAC is 60°. Point A is noted below:

A ✕

(3)

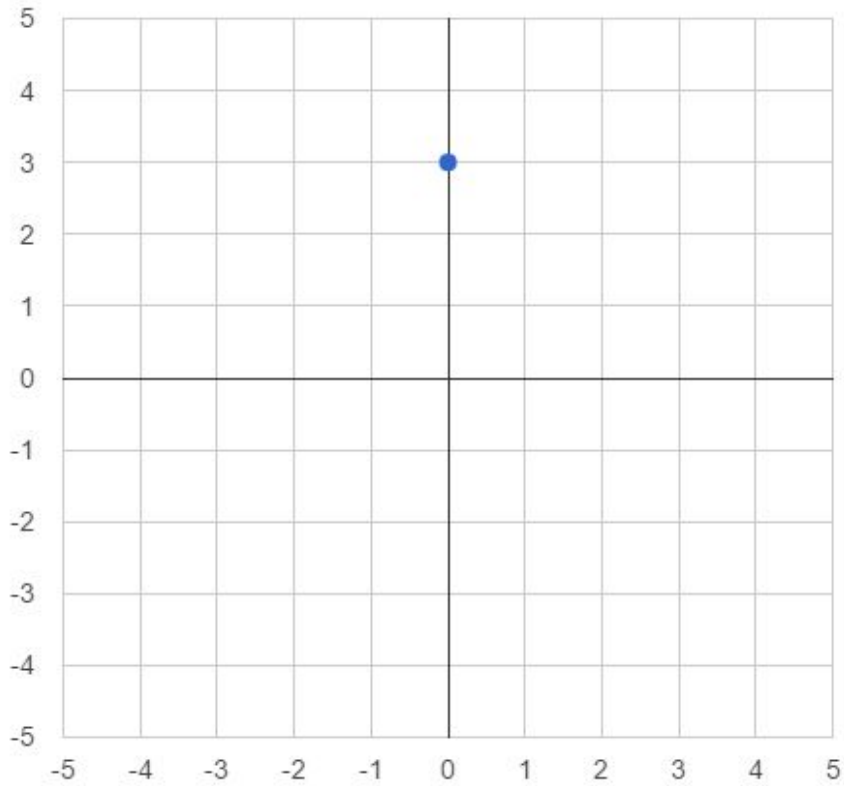b) What is the length of line BC?

Answer: _____ cm **(1)**

c) The triangle has a perpendicular height of 4.5 cm. What is the area of the triangle?

Answer: _____ cm **(3)**

9.

a) On the grid below, plot the points (0,3), (0-1), (-5,-1) and (-5, 3).

(1)

b) Join these points to make a rectangle, and label it R.   **(1)**

c) Draw the line y = x   **(1)**

d) Reflect rectangle R in this line. Label this rectangle S.   **(1)**

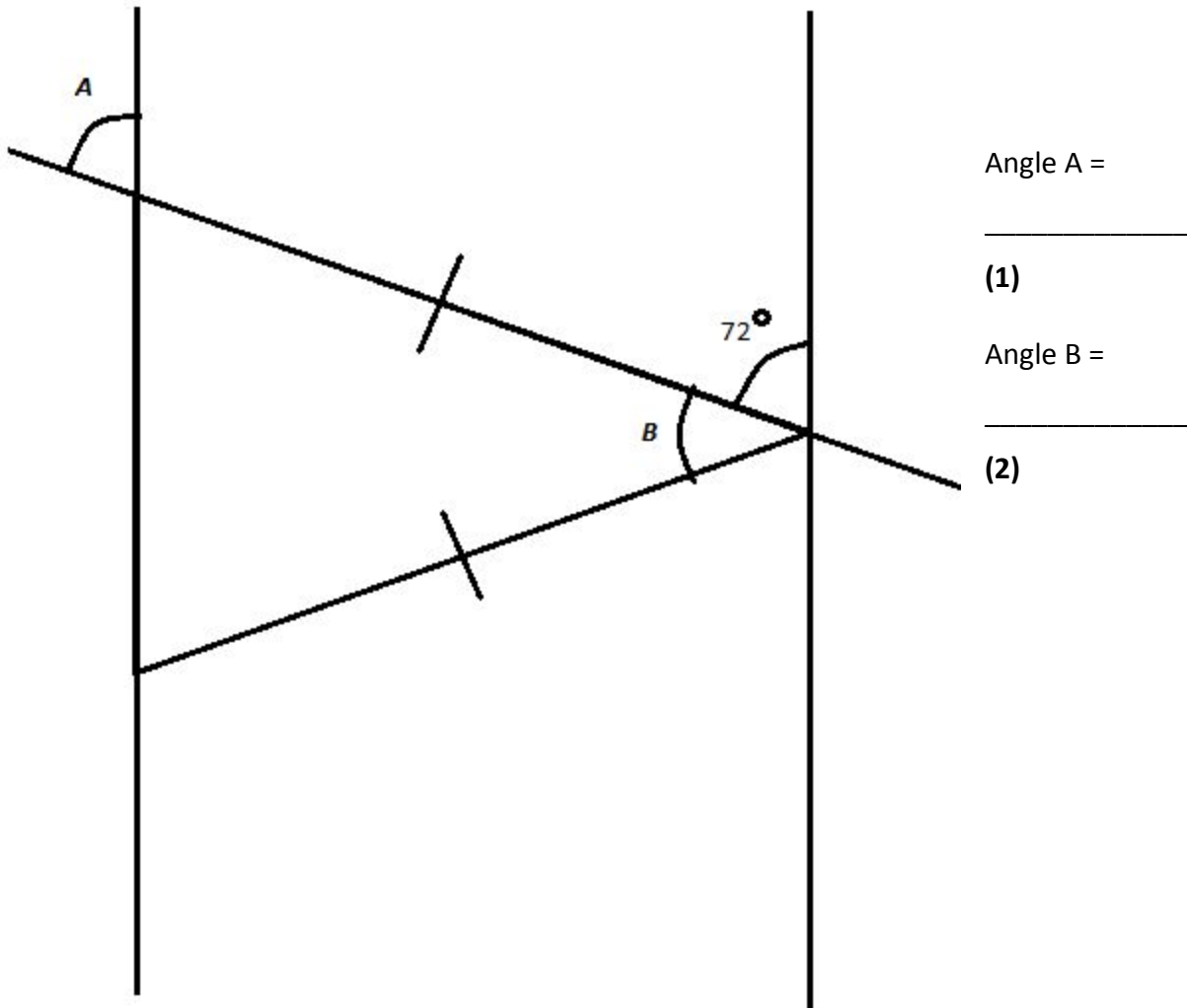e) Rotate the rectangle 90° anti-clockwise around (0, 0). Label the new shape T.   **(2)**

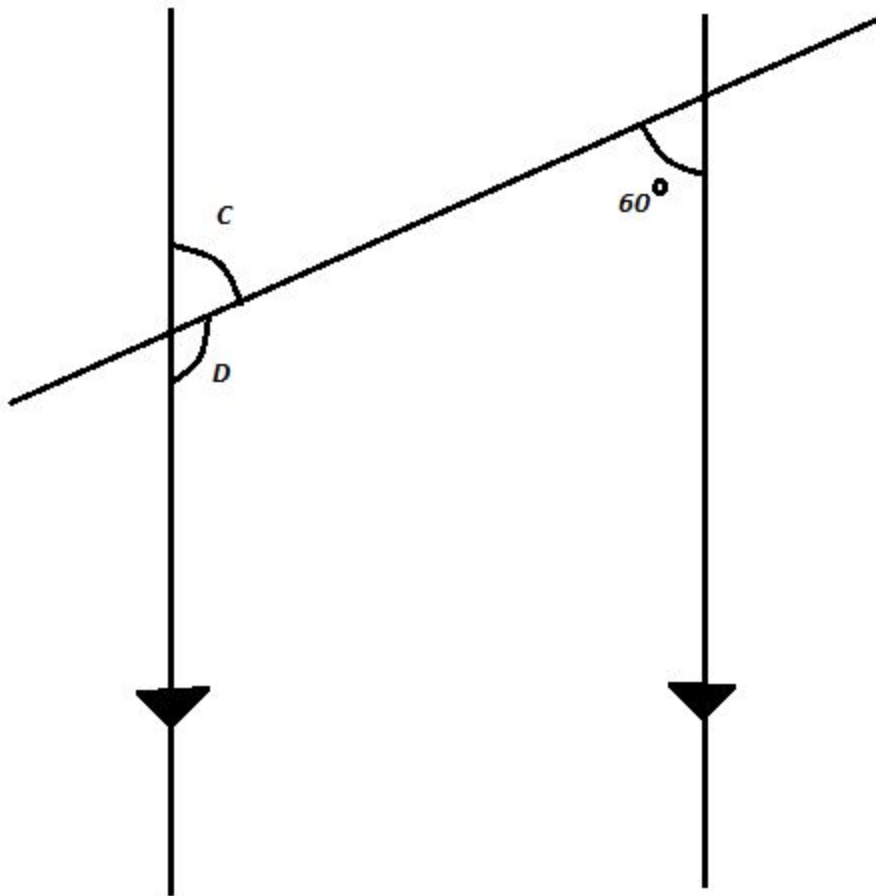f) Name one transformation that can map rectangle S to rectangle T:

Answer: _____ **(2)**

10.

    a)   Calculate the size of angles A and B, between the two parallel vertical lines. (NB - the diagram is not to scale).

Angle A =

_____

(1)

Angle B =

_____

(2)

b) Calculate the size of angles C and D, between the two parallel vertical lines. (NB - the diagram is not to scale).

Angle C =

_____ (1)

Angle D =
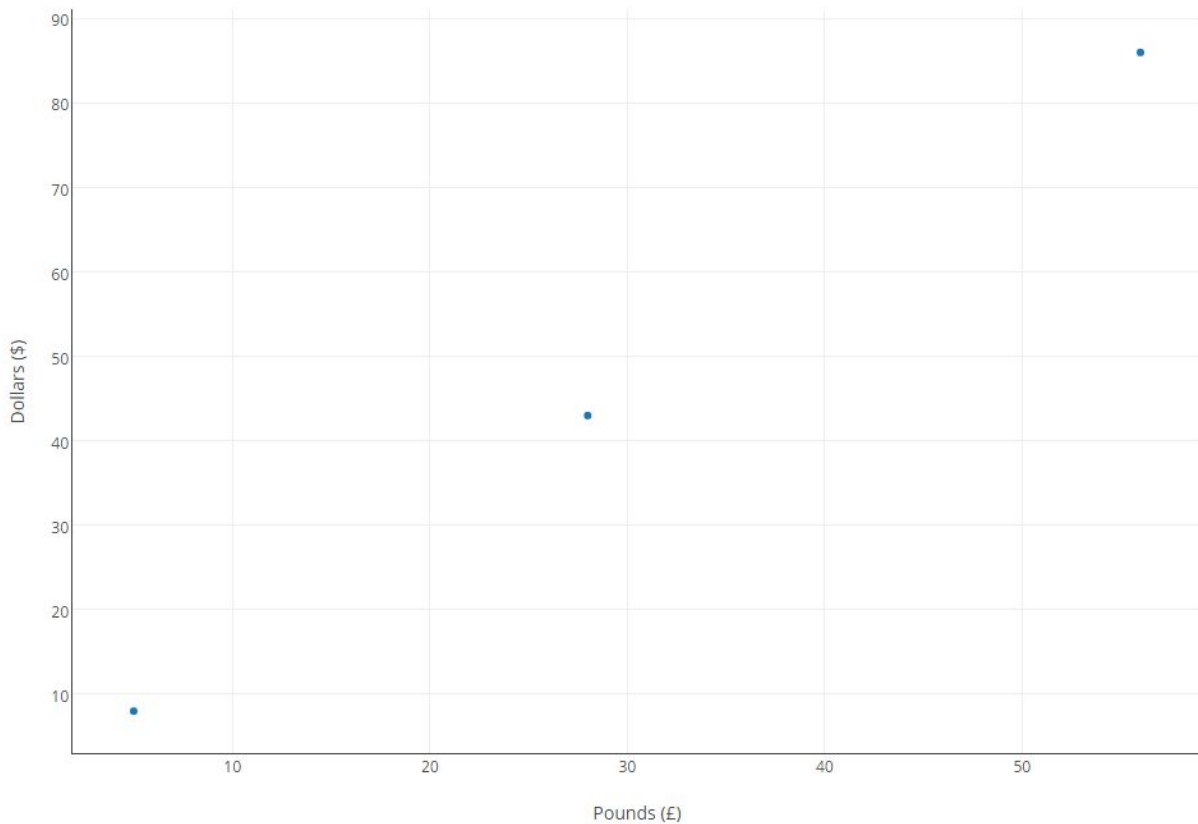
_____ (2)

11. Class 10B went to New York on a school trip. They each changed some money:

Pounds	12	5	42	28	50	34	56
Dollars	18	8	65	43	77	50	86

a) Plot the results on the below graph. 3 points have been done for you. **(3)**

b) Draw the line of best fit on the same graph **(1)**

c) Use the graph to estimate the value of £20 in dollars:

Answer: _____ cm **(2)**

d) What do you think £400 would be worth in dollars?

Answer: _____ cm **(2)**

12. Solve these equations:

   a) $9 + w = 21$

   Answer: $w =$ _____ **(1)**

   b) $5x = 60$

   Answer: $x =$ _____ **(1)**

   c) $\frac{1}{2}y - 4 = 8$

   Answer: $y =$ _____ **(2)**

   d) $\frac{1}{2}y - 4 = 8$

   Answer: $y =$ _____ **(2)**

   e) $4(2z + 3) + 3z = 56$

Answer: z = _____ **(2)**

13. A bag of sweets cost *M* pence.

   a) Write down an expression, in terms of *M*, for the cost of 3 bags of sweets.

Answer: _____ pence **(1)**

A bag of popcorn costs 20p less than 1 bag of sweets

   b) Write down an expression, in terms of *M*, for the cost of 1 bag of popcorn.

Answer: _____ pence **(1)**

5 bags of sweets cost £1.26 more than 3 bags of popcorn.

   c) Write down an equation, in terms of *M*, to show this.

Answer: _____ **(1)**

   d) Solve this equation and find the value of *M*.

Answer: M = _____ pence **(1)**

13. For the following, assume that x = -4 and y = 5.

Find the value of:

   a) 3x + y

Answer: _____ **(2)**

   b) x^2

Answer: _____ **(2)**

   c) $3y^2$

Answer: _____ **(2)**

   d) $\frac{3x + 6y}{9}$

15. Look at the following pattern:

1, 1, 2, 3, 5, 8, 13, …

These are called **Fibonacci numbers**. Let's explore them some more:

Fibonacci number	Square of this Fibonacci number	Product of the previous and next Fibonaccci numbers	Difference between column 2 and column 3
2	4	1 x 3 = 3	1
3	9	2 x 5 = 10	1
5	25	3 x 8 = 24	
8	64	5 x 13 =	
13	169		

a) Fill in the missing two rows in the table **(6)**

b) If you knew that 34 and 55 were the 9th and 10th Fibonacci Numbers, what is the 11th Fibonacci Number?

Answer: _____ **(2)**