

Write your name here

Surname

Other Names

# Mathematics

**June 2018 Paper 2 (Calculator Allowed)**

**Part 1 (First half of the paper)**

**Edexcel Higher Tier**

Time: 45 minutes

Q	Topic	Max Mark	My Marks
1	Indices	5	
2	Prime Factors, HCF and LCM	3	
3	The Equation of a Line	3	
4	Percentage Increase, Writing Ratio	5	
5	Quadratic Graphs	6	
6	Compound Measures, Percentage Change	3	
7	Transformations, Enlargement	2	
8	Two Way Tables	4	
9	Repeated Percentage Change	4	
10	Vectors, Column Vectors	3	
11	Functions, Composite Functions	3	
	Total	41	

For worked solutions and video solutions visit [mathsgenie.co.uk](http://mathsgenie.co.uk)

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 (a) Simplify  $m^3 \times m^4$

.....  
(1)

(b) Simplify  $(5np^3)^3$

.....  
(2)

(c) Simplify  $\frac{32q^9r^4}{4q^3r}$

.....  
(2)

(Total for Question 1 is 5 marks)

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2 (a) Find the lowest common multiple (LCM) of 40 and 56

.....  
(2)

$$A = 2^3 \times 3 \times 5 \qquad B = 2^2 \times 3 \times 5^2$$

(b) Write down the highest common factor (HCF) of  $A$  and  $B$ .

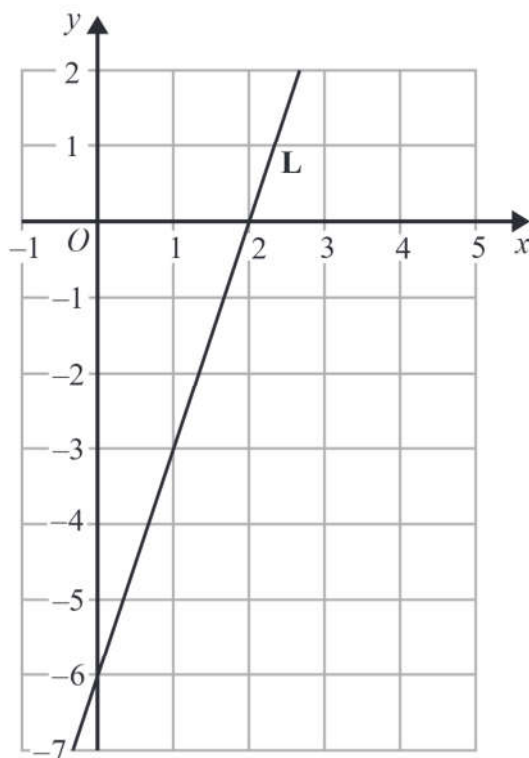
.....  
(1)

**(Total for Question 2 is 3 marks)**

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3 The line **L** is shown on the grid.



Find an equation for **L**.

(Total for Question 3 is 3 marks)

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4 Raya buys a van for £8500 plus VAT at 20%

Raya pays a deposit for the van.

She then pays the rest of the cost in 12 equal payments of £531.25 each month.

Find the ratio of the deposit Raya pays to the total of the 12 equal payments.

Give your answer in its simplest form.

.....  
(Total for Question 4 is 5 marks)



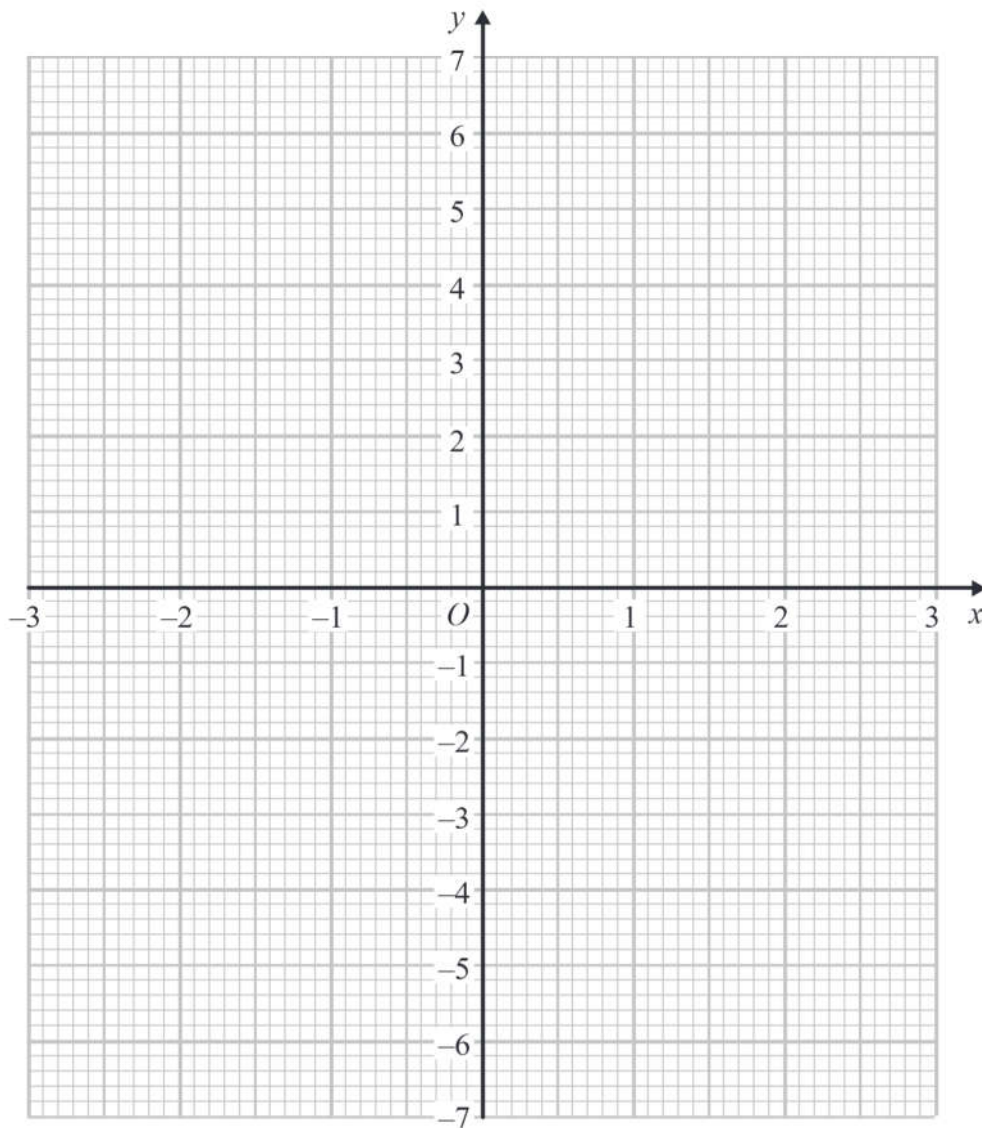
5 (a) Complete the table of values for  $y = x^2 - x - 6$

$x$	-3	-2	-1	0	1	2	3
$y$	6			-6			

(2)

(b) On the grid, draw the graph of  $y = x^2 - x - 6$  for values of  $x$  from -3 to 3

(2)



(c) Use your graph to find estimates of the solutions to the equation  $x^2 - x - 6 = -2$

(2)

(Total for Question 5 is 6 marks)

6 A force of 70 newtons acts on an area of  $20 \text{ cm}^2$

The force is increased by 10 newtons.

The area is increased by  $10 \text{ cm}^2$

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

Helen says,

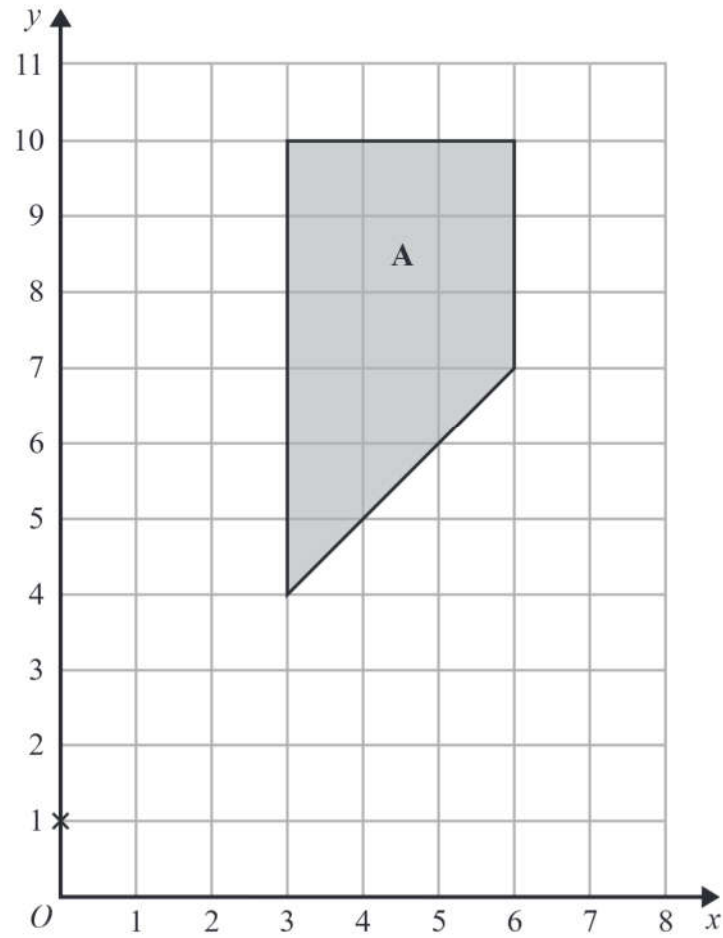
“The pressure decreases by less than 20%”

Is Helen correct?

You must show how you get your answer.

(Total for Question 6 is 3 marks)





Enlarge shape A by scale factor  $\frac{1}{3}$  centre (0, 1)

(Total for Question 7 is 2 marks)





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8 60 people were asked if they prefer to go on holiday in Britain or in Spain or in Italy.

38 of the people were male.

11 of the 32 people who said Britain were female.

8 males said Italy.

12 people said Spain.

One of the females is chosen at random.

What is the probability that this female said Spain?

.....  
(Total for Question 8 is 4 marks)



9 Jean invests £12 000 in an account paying compound interest for 2 years.

In the first year the rate of interest is  $x\%$

At the end of the first year the value of Jean's investment is £12 336

In the second year the rate of interest is  $\frac{x}{2}\%$

What is the value of Jean's investment at the end of 2 years?

£.....

(Total for Question 9 is 4 marks)

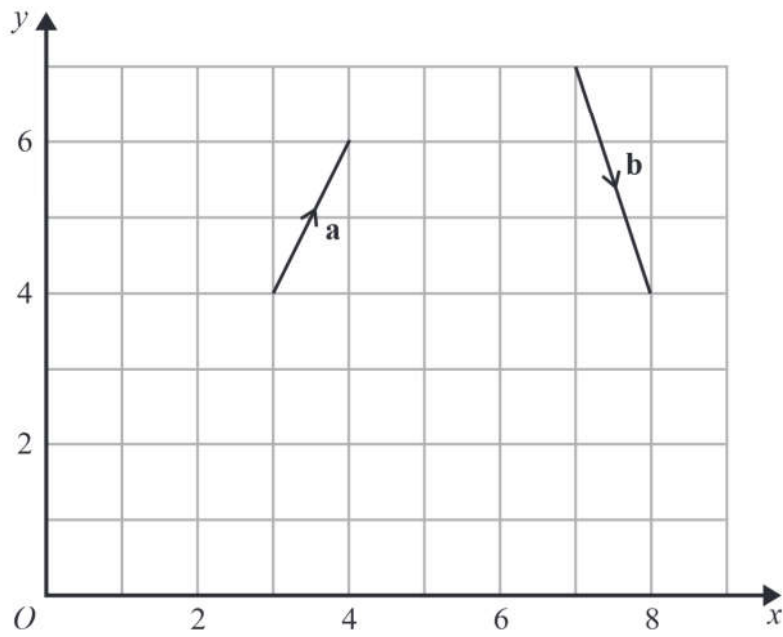


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10 The vector **a** and the vector **b** are shown on the grid.



(a) On the grid, draw and label vector  $-2\mathbf{a}$

(1)

(b) Work out  $\mathbf{a} + 2\mathbf{b}$  as a column vector.

$\begin{pmatrix} \phantom{0} \\ \phantom{0} \\ \phantom{0} \end{pmatrix}$

(2)

(Total for Question 10 is 3 marks)



11  $f$  and  $g$  are functions such that

$$f(x) = \frac{2}{x^2} \quad \text{and} \quad g(x) = 4x^3$$

(a) Find  $f(-5)$

.....  
(1)

(b) Find  $fg(1)$

.....  
(2)

(Total for Question 11 is 3 marks)

