

Name: \_\_\_\_\_

## GCSE (1 – 9)

### Direct and Inverse Proportion

#### Instructions

- Use **black** ink or ball-point pen.
- Answer all questions.
- Answer the questions in the spaces provided
  - *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

#### Information

- The marks for each question are shown in brackets
  - *use this as a guide as to how much time to spend on each question.*

#### Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end

**1** A machine fills 1000 bottles in 5 hours.

Work out how many hours it would take the machine to fill 1200 bottles.

.....  
**(Total for question 1 is 2 marks)**

**2** It costs £0.75 to buy 5 bananas.

Work out how much it would cost to buy 7 bananas.

.....  
**(Total for question 2 is 2 marks)**

**3** 3 tins of beans and 4 tins of tomatoes costs £2.73.

5 tins of beans costs £1.55.

Work out how much one tin of tomatoes costs.

.....  
**(Total for question 3 is 2 marks)**

**4** There are 500 sheets in a pack of paper. 500 sheets of paper weigh 2.5kg.

Work out the weight of 50 sheets of paper.

.....  
**(Total for question 4 is 2 marks)**

**5** It takes 2 painters 4 days to complete a job.

Work out how many days it would take 1 painter to complete the same job.

.....  
**(Total for question 5 is 2 marks)**

**6** It takes 3 machines 2 days to produce a batch of products

Work out how long it would take 1 machine to produce the same batch of products.

.....  
**(Total for question 6 is 2 marks)**

**7** It takes 3 painters 6 days to complete a job.

Work out how many days it would take 2 painters to complete the same job.

.....  
**(Total for question 7 is 2 marks)**

**8** It takes 5 machines 6 hours to produce 1000 DVDs

Work out how long it would take 4 machines to produce 1000 DVDs.

.....  
**(Total for question 8 is 2 marks)**

**9**  $x$  is inversely proportional to  $y$ .

$x$  is given by the formula: 
$$x = \frac{1000}{y}$$

Find the value of  $x$  when  $y = 50$

$x = \dots$

**(Total for question 9 is 2 marks)**

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**10**  $y$  is directly proportional to  $x$ .

$y$  is given by the formula: 
$$y = 0.4x$$

Find the value of  $y$  when  $x = 6$

$y = \dots$

**(Total for question 10 is 2 marks)**

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- 11 The weight of a piece of wire ( $w$  grams) is directly proportional to its length ( $l$  cm).

$w$  is given by the formula:  $w = 30l$

Find the length of a wire weighing 75 grams.

$$l = \dots \text{cm}$$

**(Total for question 11 is 2 marks)**

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- 12 The force,  $F$ , between two magnets is inversely proportional to the square of the distance,  $x$  cm, between them.

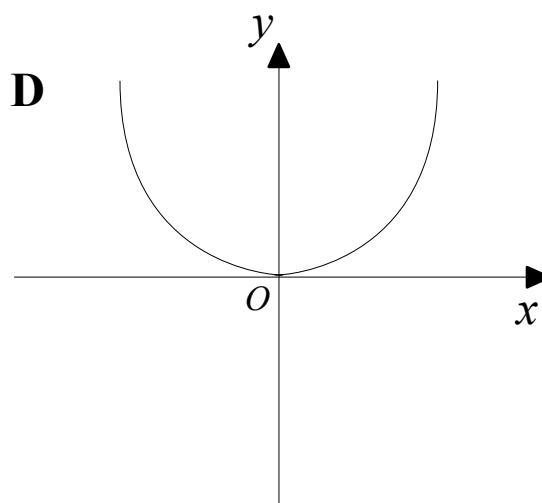
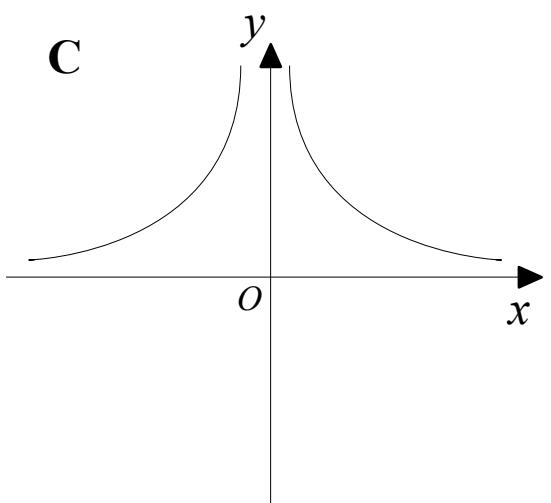
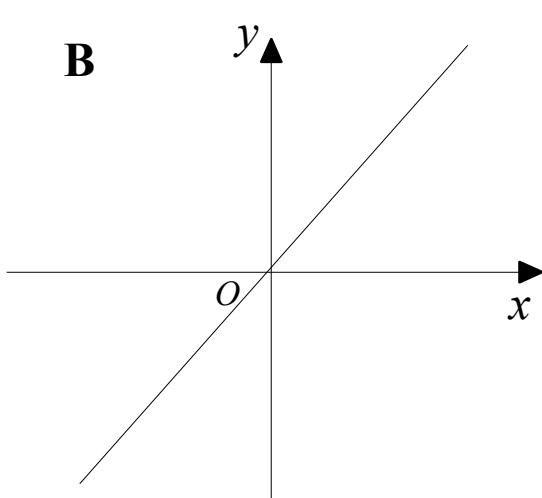
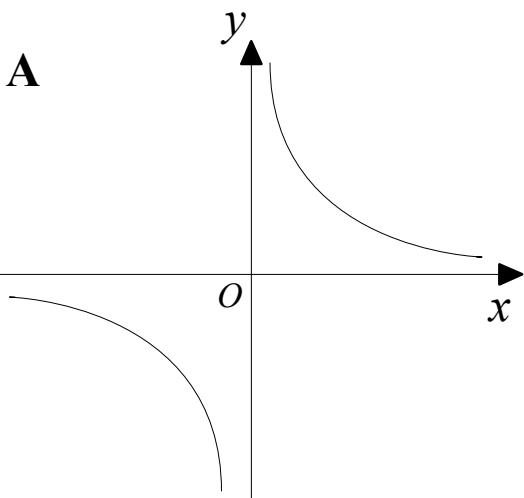
$F$  is given by the formula:  $F = \frac{36}{x^2}$

Find the Force when two magnets are 3 cm apart.

$$F = \dots \text{N}$$

**(Total for question 12 is 2 marks)**

13 Here are four graphs.



Match each graph with a statement in the table below.

Proportionality relationship	Graph letter
$y$ is directly proportional to $x$	
$y$ is inversely proportional to $x$	
$y$ is directly proportional to $x^2$	
$y$ is inversely proportional to $x^2$	

(Total for question 13 is 2 marks)