

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

## Exam Style Questions



### Direct and Inverse Proportion

Corbettmaths

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You may use tracing paper if needed

#### Guidance

1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

Revision for this topic

[www.corbettmaths.com/contents](http://www.corbettmaths.com/contents)

Video 254

Video 255



1.  $y$  is directly proportional to the square of  $x$ .  
When  $y = 24$ ,  $x = 2$ .



Find the value of  $y$  when  $x = 4$ .

$y = \dots\dots\dots$   
(3)

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2. The cost of a circular table is directly proportional to the square of the radius.  
A circular table with a radius of 40cm cost £50.



What is the cost of a circular table with a radius of 60cm?

£.....  
(3)

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3. The time taken,  $t$  seconds, that it takes a water heater to boil water is inversely proportional to the power,  $p$  watts, of the water heater.



When  $P = 2000\text{W}$ ,  $T = 252$  seconds.

Find the time it takes to boil water when  $P = 800\text{W}$

.....seconds  
(3)

4. H varies directly to the cube of c.  
When  $H = 40$ ,  $c = 2$ .



- (a) Express H in terms of c.

$$H = \dots\dots\dots$$

**(3)**

- (b) Find the value of H when  $c = 5$ .

$$H = \dots\dots\dots$$

**(1)**

- (c) Find the value of c when  $H = 5000$ .

$$c = \dots\dots\dots$$

**(1)**

5. The force,  $F$  newtons, exerted by a magnet on a metal object is inversely proportional to the square of the distance  $d$  cm.



When  $d = 2$  cm,  $F = 50$  N.

(a) Express  $F$  in terms of  $d$ .

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

**(3)**

(b) Find the force when the distance between the magnet and metal object is 10cm

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

**(1)**

(c) Find the distance between the magnet and metal object when the force is 8N.

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

**(1)**

(d) Explain what happens to  $F$  when  $d$  is halved.

.....  
.....  
.....

**(1)**

6. A and B are positive numbers.  
A is inversely proportional to B.  
When  $A = 4$ ,  $B = 36$ .



Find the value of A when  $B = A$ .

$$A = \dots\dots\dots$$

**(4)**

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7. C is directly proportional to the square root of y.  
When  $C = 12.8$ ,  $y = 16$ .



(a) Express C in terms of y.

$$C = \dots\dots\dots$$

**(3)**

(b) Find C when  $y = 400$

$$C = \dots\dots\dots$$

**(1)**

8. The time taken,  $t$ , for passengers to be checked-in for a flight is inversely proportional to the square of the number of staff,  $s$ , working.



It takes 30 minutes passengers to be checked-in when 10 staff are working.

(a) Find an equation connecting  $t$  and  $s$ .

.....  
**(3)**

(b) What is the minimum number of staff that must be working so that the time taken is under 60 minutes?

.....  
**(3)**

9. a is directly proportional to  $\sqrt{c}$ .  
w is inversely proportional to  $a^3$ .



When  $c = 49$ ,  $a = 35$

When  $a = 2$ ,  $w = 16$ .

Find the value of  $w$  when  $c = 4$ .

$w = \dots\dots\dots$   
(6)

10. The number of days,  $D$ , to complete research is inversely proportional to the number of researchers,  $R$ , who are working.

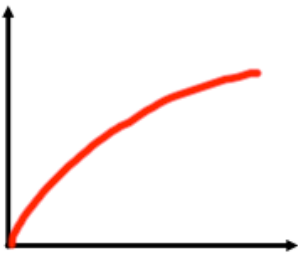


The research takes 125 days to complete if 16 people work on it.

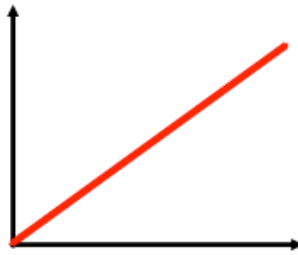
Find how many people are needed to complete the research in 40 days.



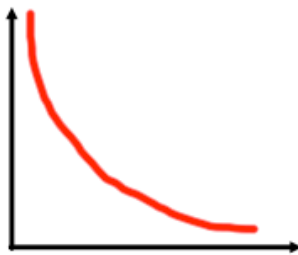
11. Match each graph to the correct relationship.



$$y \propto \frac{1}{x}$$



$$y \propto \sqrt{x}$$



$$y \propto x$$

(3)