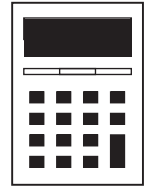


GCSE MATHEMATICS

Direct & Inverse Proportion



AQA  These questions have been taken or modified from previous AQA GCSE Mathematics Papers.

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer **all** questions.
- You must answer the questions in the spaces provided.
- If your calculator does not have a π button, take the value of π to be 3.14 unless another value is given in the question.

Information

- The marks for questions are shown in brackets.
- The quality of your written communication is specifically assessed in questions that are indicated with an asterisk (*).

Advice

- Read each question carefully before you start to answer it.
 - In all calculations, show clearly how you work out your answer.
 - Use the number of marks for the question as a guide to the amount of time you need to spend.
 - Look at previous parts of the question, e.g. a), b), c) i) as there may be information there you need to answer later parts.
 - Check your answer is realistic and appropriate.
 - For calculator decimal numbers always write your full calculator display in the working out area and then, if you need to, round the answer on the answer line.
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1 A is directly proportional to the square of R .
When $R = 30$, $A = 2826$

1 (a) Form an equation connecting A and R .

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.....
.....

Answer (3 marks)

1 (b) Work out the value of A when $R = 15$

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.....

Answer (2 marks)

2 y is directly proportional to R^2
When $R = 4$, $y = 24$

Work out the value of R when $y = 1350$

[5 marks]

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Answer

3 A is proportional to the square of L . When $A = 4$, $L = 4$
Work out the value of A when $L = 25$

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Answer (4 marks)

4 M is directly proportional to r^3
When $r = 5$, $M = 200$

4 (a) Work out the value of M when $r = 8$

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Answer (4 marks)

4 (b) Work out the value of r when $M = 3125$

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Answer (3 marks)

5 y is directly proportional to the square of x .
 $y = 28$ when $x = 2$

5 (a) Obtain an equation connecting y and x .

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Answer (3 marks)

5 (b) y is directly proportional to the square of x .
 x is inversely proportional to w .

Tick a box to show which **one** of the statements below is correct.

y is directly proportional to w

y is directly proportional to the square of w

y is inversely proportional to w

y is inversely proportional to the square of w

.....
.....

(1 mark)

6 y is **inversely** proportional to x .

When $y = 5$, $x = 9$

6 (a) Work out an equation connecting y and x .

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Answer (3 marks)

6 (b) Work out the value of y when $x = 15$

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Answer (2 marks)

7 y is inversely proportional to x .
When $y = 2$, $x = 5$

Work out an equation connecting y and x .

[3 marks]

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Answer

8 W is inversely proportional to x .
When $W = 6$, $x = 20$

Work out the value of W when $x = 24$

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Answer (4 marks)

9 R is inversely proportional to A .

$R = 12.1$ when $A = 1.5$

9 (a) Work out a formula connecting R and A .

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Answer (3 marks)

9 (b) Work out the value of R when $A = 4$

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.....

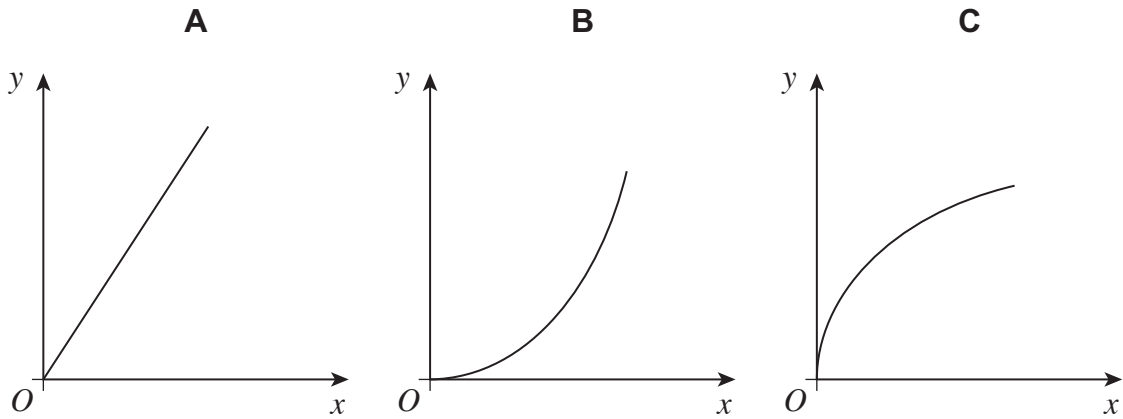
Answer (2 marks)

10 The fare, £ y , for a journey is directly proportional to the square root of the distance, x miles.

10 (a) Which sketch graph represents this information?

Circle the correct letter.

[1 mark]



10 (b) A 100 mile journey costs £36

What is the cost of a 250 mile journey?
Give your answer to the nearest pound.

[4 marks]

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Answer £

11 y is inversely proportional to x^2 where $x > 0$

When $x = 2$, $y = 20$

11 (a) Form an equation for y in terms of x .

[3 marks]

Answer _____

11 (b) Work out the value of x when $y = 5$

[2 marks]

Answer _____

12 The number of people, n , who can safely be in a room is directly proportional to the area, A , of the room.

12 people can safely meet in a room of area 54 m^2

The table shows information about four rooms.

Room	P	Q	R	S
Area (m^2)	36	108	150	210
Cost of hire per day (£)	85	120	195	240

12 (a) Jack wants to hire a room for 28 people.

Which room should he hire to minimise his cost?

You **must** show your working.

[4 marks]

Answer _____

12 (b) How many **more** people can come to the meeting without increasing the cost of hire?

[2 marks]

Answer _____

13 (a) Here are four equations connecting y and x .
 k is a constant.

$$y = kx$$

$$y = \frac{k}{x}$$

$$y = kx^2$$

$$y = \frac{k}{x^2}$$

Match each equation to its statement.

y is **directly** proportional to x

Equation

y is **directly** proportional to x^2

Equation

y is **inversely** proportional to x

Equation

y is **inversely** proportional to x^2

Equation

(2 marks)

13 (b) y is **inversely** proportional to x .
When $x = 3$, $y = 8$

Work out the value of y when $x = 5$

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.....

.....

Answer

(3 marks)