Direct and Inverse Proportion: exam questions

10 questions · 28 marks · mark schemes at the end

Name _____ Date _____ Score / 28

- Calculators are allowed on both 4MA1 Higher papers (1H and 2H). Show your working: most marks are for method.
- Mark schemes start after the questions. M marks are for a correct method, A marks for an accurate answer that follows a correct method, and B marks for a correct result on its own.
- Online, with more practice: igcsemathrevision.com/igcse-frontend/4ma1/exam-questions/direct-and-inverse-proportion

1. **3 marks**

y is directly proportional to x. When $x = 4$, $y = 12$.

Find the value of y when $x = 7$.

2. **3 marks**

y is directly proportional to x^2. When $x = 5$, $y = 50$.

Find the value of y when $x = 8$.

3. **3 marks**

y is inversely proportional to x. When $x = 4$, $y = 6$.

Find the value of x when $y = 8$.

4. 3 marks

d is directly proportional to the square root of h. When $h = 16$, $d = 12$.

Find the value of h when $d = 21$.

5. 3 marks

F is inversely proportional to d^2. When $d = 3$, $F = 20$.

Find the value of F when $d = 6$.

6. 2 marks

(a) y is directly proportional to x^3. x is doubled. What happens to y? **(1)**

(b) y is inversely proportional to $\sqrt{x}$. x is multiplied by 9. What happens to y? **(1)**

7. 3 marks

t is inversely proportional to s. When $s = 48$, $t = 2.5$.

(a) Find a formula for t in terms of s. **(2)**

(b) Work out the value of t when $s = 60$. **(1)**

8. **2 marks**

6 workers take 15 days to build a wall. All the workers work at the same rate.

How many days would 9 workers take?

9. **3 marks**

The mass, m grams, of a metal ball is directly proportional to the cube of its radius, r cm. A ball of radius 3 cm has a mass of 270 g.

Work out the radius of a ball of mass 80 g.

10. **3 marks**

P is inversely proportional to V. V is increased by 25%.

Work out the percentage change in P.

Answers and worked solutions

Question 1 — 3 marks

M1 $y = kx$

M1 $k = 3$

A1 21

Answer: 21

Question 2 — 3 marks

M1 $y = kx^2$

M1 $k = 2$

A1 128

Answer: 128

Question 3 — 3 marks

M1 $y = \dfrac{k}{x}$

M1 $k = 24$

A1 3

Answer: 3

Question 4 — 3 marks

M1 $d = k\sqrt{h}$

M1 $k = 3$

A1 49

Answer: 49

Question 5 — 3 marks

M1 $F = \dfrac{k}{d^2}$

M1 $k = 180$

A1 5

Answer: 5

Question 6 — 2 marks

(a)

B1 y is multiplied by 8

(b)

B1 y is divided by 3

Answer: (a) multiplied by 8; (b) divided by 3

Question 7 — 3 marks

(a)

M1 $t = \dfrac{k}{s}$, $k = 48 \times 2.5$

A1 $t = \dfrac{120}{s}$

(b)

B1 2

Answer: (a) $t = \dfrac{120}{s}$; (b) 2

Question 8 — 2 marks

M1 $6 \times 15 = 90$ worker-days

A1 10 days

Answer: 10 days

Question 9 — 3 marks

M1 $m = kr^3$

M1 $k = 10$

A1 2 cm

Answer: 2 cm

Question 10 — 3 marks

M1 $P = \dfrac{k}{V}$

M1 $\dfrac{k}{1.25V} = 0.8 \times \dfrac{k}{V}$

A1 a 20% decrease

Answer: a 20% decrease

Online, with every solution: igcsemathrevision.com/igcse-frontend/4ma1/exam-questions/direct-and-inverse-proportion
Our own original questions, written and checked by IGCSE Math Revision. Independent, not affiliated with Pearson Edexcel.