



ACHIEVE ACADEMY

GCSE Maths — Higher Tier

Direct & Inverse Proportion · Practice Booklet

NAME: _____

CLASS: _____

DATE: _____

☐ Developing

☒ Secure

☐ Greater Depth

Answer every question in the working space provided. Method marks are available for correct working even if the final answer is wrong. Check the time allowed with your tutor before you start.

Direct & Inverse Proportion

Total marks available: 115

● Direct & Inverse Proportion

Q1

[4 marks]

y is inversely proportional to x . $y = 3$ when $x = 9$. (a) Find an equation for y in terms of x . (b) Find y when $x = 3$.

Q2

[4 marks]

y is directly proportional to x . $y = 15$ when $x = 10$. (a) Find an equation for y in terms of x . (b) Find y when $x = 14$.

Q3

[4 marks]

y is directly proportional to x . $y = 24$ when $x = 20$. (a) Find an equation for y in terms of x . (b) Find y when $x = 15$.

Q4

[4 marks]

y is directly proportional to x . $y = 12$ when $x = 8$. (a) Find an equation for y in terms of x . (b) Find y when $x = 14$.

Q5

[4 marks]

y is inversely proportional to x . $y = 8$ when $x = 4$. (a) Find an equation for y in terms of x . (b) Find y when $x = 8$.

Q6

[4 marks]

y is inversely proportional to x . $y = 2$ when $x = 9$. (a) Find an equation for y in terms of x . (b) Find y when $x = 18$.

Q7

[4 marks]

y is inversely proportional to x . $y = 6$ when $x = 7$. (a) Find an equation for y in terms of x . (b) Find y when $x = 6$.

Q8

[4 marks]

y is inversely proportional to x . $y = 4$ when $x = 2$. (a) Find an equation for y in terms of x . (b) Find y when $x = 8$.

Q9

[4 marks]

y is inversely proportional to x . $y = 6$ when $x = 2$. (a) Find an equation for y in terms of x . (b) Find y when $x = 12$.

Q10

[4 marks]

y is directly proportional to x . $y = 9$ when $x = 12$. (a) Find an equation for y in terms of x . (b) Find y when $x = 20$.

Q11

[4 marks]

y is inversely proportional to x^2 . When $x = 3$, $y = 3$. Find y when $x = 1$.

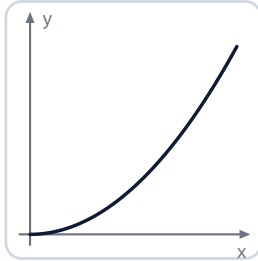
Q12

[3 marks]

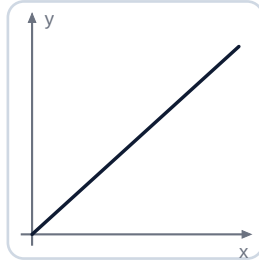
Each sketch shows how y varies with x (for $x > 0$).

1 $y \propto x^3$ **2** $y \propto x^2$ **3** $y \propto x$ **4** $y \propto \frac{1}{x}$

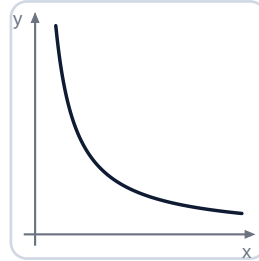
Match each sketch A, B, C and D to the number of its statement.



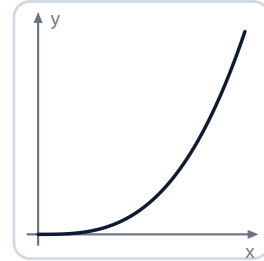
A



B



C



D

Q13

[4 marks]

The cost, C , of a circular pizza is directly proportional to the square of its diameter, d . A pizza with diameter 6 cm costs £2.88. Find the cost of a pizza with diameter 13 cm.

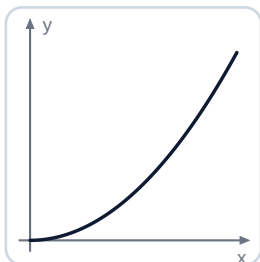
Q14

[3 marks]

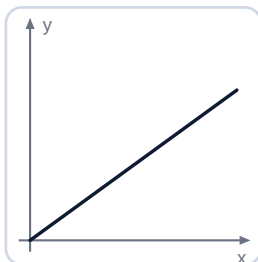
Each sketch shows how y varies with x (for $x > 0$).

1 $y \propto x$ **2** $y \propto x^3$ **3** $y \propto x^2$ **4** $y \propto \frac{1}{x}$

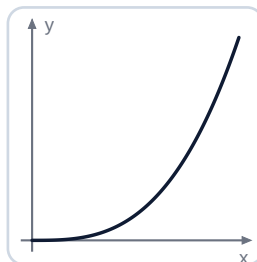
Match each sketch A, B, C and D to the number of its statement.



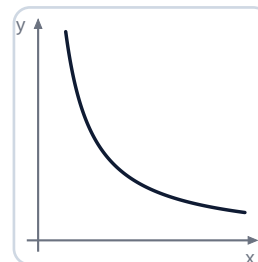
A



B



C



D

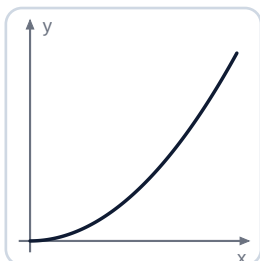
Q15

[3 marks]

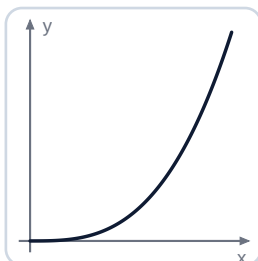
Each sketch shows how y varies with x (for $x > 0$).

1 $y \propto \frac{1}{x}$ **2** $y \propto x$ **3** $y \propto x^2$ **4** $y \propto x^3$

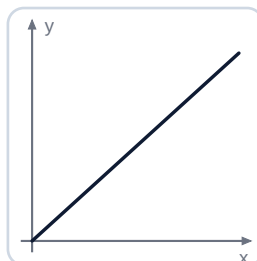
Match each sketch A, B, C and D to the number of its statement.



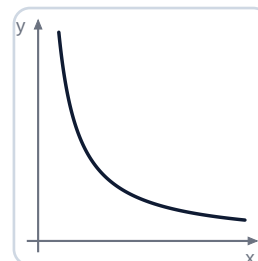
A



B



C



D

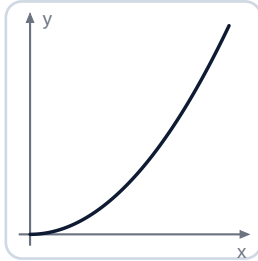
Q16

[3 marks]

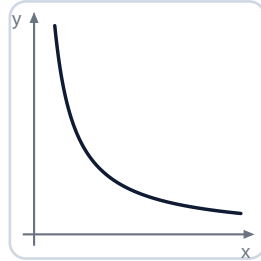
Each sketch shows how y varies with x (for $x > 0$).

1 $y \propto \frac{1}{x}$ 2 $y \propto x$ 3 $y \propto x^2$ 4 $y \propto x^3$

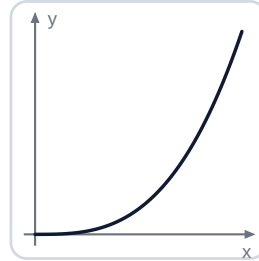
Match each sketch A, B, C and D to the number of its statement.



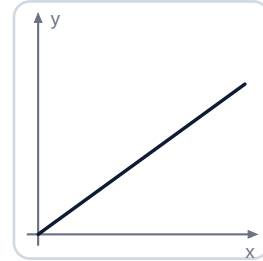
A



B



C



D

Q17

[4 marks]

The cost, C , of a circular pizza is directly proportional to the square of its diameter, d . A pizza with diameter 12 cm costs £14.40. Find the cost of a pizza with diameter 8 cm.

Q18

[4 marks]

y is inversely proportional to x^2 . When $x = 2$, $y = 7$. Find y when $x = 1$.

Q19

[4 marks]

The cost, C , of a circular pizza is directly proportional to the square of its diameter, d . A pizza with diameter 4 cm costs £0.48. Find the cost of a pizza with diameter 6 cm.

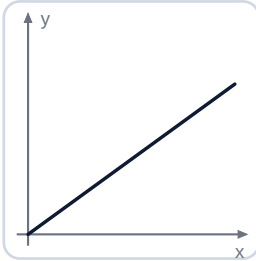
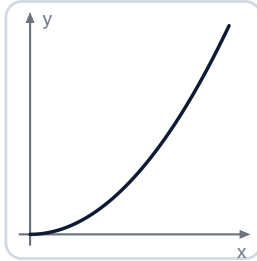
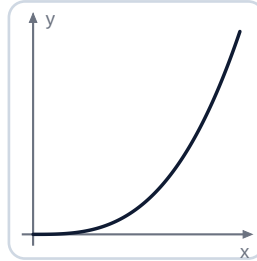
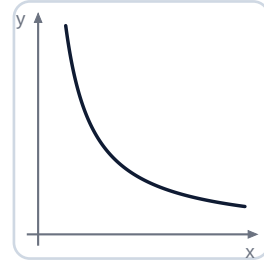
Q20

[3 marks]

Each sketch shows how y varies with x (for $x > 0$).

1 $y \propto x^2$ **2** $y \propto \frac{1}{x}$ **3** $y \propto x^3$ **4** $y \propto x$

Match each sketch A, B, C and D to the number of its statement.

**A****B****C****D**

Q21

[4 marks]

y is directly proportional to x^2 . If x increases by 50%, find the percentage change in y .

Q22

[4 marks]

y is directly proportional to x^3 . If x increases by 100%, find the percentage change in y .

Q23

[4 marks]

The intensity, I , of light from a source is inversely proportional to the square of the distance, d , from the source. At a distance of 2 m, the intensity is 18 units. Find the intensity at a distance of 6 m.

Q24

[4 marks]

The intensity, I , of light from a source is inversely proportional to the square of the distance, d , from the source. At a distance of 6 m, the intensity is 3 units. Find the intensity at a distance of 2 m.

Q25

[4 marks]

y is directly proportional to x^2 . If x decreases by 50%, find the percentage change in y .

Q26

[4 marks]

The intensity, I , of light from a source is inversely proportional to the square of the distance, d , from the source. At a distance of 5 m, the intensity is 8 units. Find the intensity at a distance of 2 m.

Q27

[4 marks]

The intensity, I , of light from a source is inversely proportional to the square of the distance, d , from the source. At a distance of 6 m, the intensity is 5 units. Find the intensity at a distance of 2 m.

Q28

[4 marks]

The intensity, I , of light from a source is inversely proportional to the square of the distance, d , from the source. At a distance of 3 m, the intensity is 12 units. Find the intensity at a distance of 2 m.

Q29

[4 marks]

The intensity, I , of light from a source is inversely proportional to the square of the distance, d , from the source. At a distance of 2 m, the intensity is 20 units. Find the intensity at a distance of 4 m.

Q30

[4 marks]

y is directly proportional to x^2 . If x increases by 10%, find the percentage change in y .