

Inverse Proportion: $y = k/x$ *extend*

ANSWERS 

1



F is directly proportional to m and inversely proportional to d^2 . When $m = 4$ and $d = 2$, $F = 30$. Find F when $m = 10$ and $d = 5$.

$$F = \frac{km}{d^2}; 30 = \frac{4k}{4}, k = 30$$

$$\frac{30 \times 10}{25} = 12$$

$$F = 12$$

Answer

2



y is inversely proportional to $\sqrt{x}$. Find the percentage change in x that increases y by 25%.

$$y \times 1.25 \text{ means } \sqrt{x} \div 1.25$$

$$x \div 1.25^2 = 0.64x$$

$$\text{a } 36\% \text{ decrease}$$

Answer

3



y is inversely proportional to x . When $x = a$, $y = a + 6$. When $x = 2a$, $y = a - 1$. Find a .

$$a(a + 6) = 2a(a - 1)$$

$$a + 6 = 2a - 2$$

$$a = 8$$

Answer

4



The cost each person pays to hire a coach is inversely proportional to the number of people. With 30 people, each pays £14.40. Then 6 more people join. How much does each person save?

$$30 \times 14.40 = \text{£}432$$

$$432 \div 36 = \text{£}12$$

$$\text{£}2.40$$

Answer

5



A satellite's weight is inversely proportional to the square of its distance from the Earth's centre. At the surface, 6400 km from the centre, it weighs 800 N. How high above the surface does it weigh 200 N?

$$\text{weight} \div 4, \text{ so distance} \times 2$$

$$12\,800 \text{ km from the centre}$$

$$6400 \text{ km}$$

Answer

6



p is inversely proportional to q . When $q = 4$, $p = 9$. Find the values of q for which $p = q - 5$.

$$\frac{36}{q} = q - 5$$

$$q^2 - 5q - 36 = 0, (q - 9)(q + 4) = 0$$

$$q = 9 \text{ or } q = -4$$

Answer

7



y is inversely proportional to x^n . Use the table to find n , then find y when $x = 3$.

x	2	4	8
y	72	18	4.5

$$x^2y = 288 \text{ each time}$$

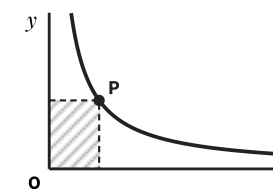
$$n = 2, y = 32$$

Answer

8



y is inversely proportional to x . P is any point on the graph. Prove that the shaded rectangle always has the same area.



$$P \text{ is } (x, \frac{k}{x})$$

$$\text{area} = x \times \frac{k}{x} = k, \text{ a constant}$$

$$\text{area} = k$$

Proof