

Solutions to Past Paper Questions – Proportionality

14) (a) $y = \frac{k}{x}$

Substitute $x=3, y=24$

$$\Rightarrow 24 = \frac{k}{3}$$

$$\Rightarrow k = 72$$

Formula is $y = \frac{72}{x}$

(b) $y = \frac{72}{6} = 12$

(c) $4.8 = \frac{72}{x} \Rightarrow 4.8x = 72 \Rightarrow x = 15$

17) (a) $E = kv^2$

To find k , $15480 = k \times 6^2 \Rightarrow k = 430$

So $E = 430v^2$

(b) $8707.5 = 430v^2 \Rightarrow v^2 = 20.25 \Rightarrow v = 4.5 \text{ m/s}$

14) (a) $y \propto \frac{1}{x^2} \Rightarrow y = \frac{k}{x^2}$

$$x=4, y=3 \Rightarrow 3 = \frac{k}{4^2}$$

$$\Rightarrow 3 \times 16 = k \text{ so } k = 48$$

So the formula is $y = \frac{48}{x^2}$

(b) If $x = 5$, $y = \frac{48}{25^2} = 1.92$

15) (a) $d \propto L^3 \Rightarrow d = kL^3$

Substitute $d = 20, L = 150$

$$20 = k \times 150^3$$

$$k = \frac{20}{150^3} = \frac{1}{168750}$$

So $d = \frac{1}{168750} L^3$

(b) $15 = \frac{1}{168750} L^3$

$$2531250 = L^3$$

$$L = 136$$

13) (a) $y \propto x^2$, so $y = kx^2$
 $25 = k4^2$

$$k = \frac{25}{16}$$

Hence $y = \frac{25}{16} x^2$

(b) $y = \frac{25}{16} \times 2^2$

$$y = \frac{25}{4} = 6\frac{1}{4}$$

(c) $9 = \frac{25}{16} x^2$

$$\frac{9 \times 16}{25} = x^2$$

$$\frac{144}{25} = x^2$$

$$\frac{12}{5} = x$$