

2nd July

Higher Plus 5-a-day



Corbettmaths

$(x + 3)(x + a)(bx - 3)$ is expanded to give

$$2x^3 - x^2 - 15x + 18$$

Find a and b.

$$a = -2 \quad b = 2$$

$$3 \times a \times -3 = 18$$

$$-9a = 18$$

$$a = -2$$

$$x \times x \times bx = 2x^3$$

$$b = 2$$

w is proportional to \sqrt{x}

x is decreased by 9.75%

Work out the percentage decrease in w.

$$5\%$$

$$w = k \times \sqrt{x}$$

$$\sqrt{0.9025x}$$

$$= 0.95\sqrt{x}$$

Liquid A has a density of 0.7g/cm^3
Liquid B has a density of 1.5g/cm^3
Liquid C has a density of 1.25g/cm^3

200g of liquid A, 1kg of liquid B and 500g of liquid C are mixed to make liquid D.

Work out the density of liquid D

(A) $v = 285.714285\text{cm}^3$

(B) $v = 666.6\text{cm}^3$

(C) $v = 400\text{cm}^3$

(D) $v = 1352.381\text{cm}^3$

$$d = \frac{m}{v}$$

$$\frac{1700}{1352.381} = 1.257\text{g/cm}^3$$

$$v = \frac{m}{d}$$

One solution of a quadratic equation in the form

$$y = ax^2 + bx + c$$

is

$$x = \frac{3 + \sqrt{65}}{4}$$

$$b^2 - 4ac = 65$$

$$9 - 8c = 65$$

$$-8c = 56$$

$$c = -7$$

Find possible values of a, b and c.

$$a = 2$$

$$b = -3$$

$$c = -7$$

$$f(x) = 10 - 5x \quad g(x) = \frac{1}{3}x - 1$$

Solve $f^{-1}(x) = g^{-1}(x)$

$$y = 10 - 5x$$

$$5x = 10 - y$$

$$x = \frac{10 - y}{5}$$

$$y = \frac{1}{3}x - 1$$

$$3y = x - 3$$

$$x = 3y + 3$$

$$f^{-1}(x) = \frac{10 - x}{5} \quad g^{-1}(x) = 3x + 3$$

$$\frac{10 - x}{5} = 3x + 3$$

$$10 - x = 15x + 15$$

$$-5 = 16x$$

$$x = -\frac{5}{16}$$