

Starter

1) Factorise fully: a) $3m^2 - 27$ b) $2c^2 - 11c - 21$

$$= 3(m^2 - 9) = 3(m+3)(m-3)$$

$$= (c+7)(2c-3)$$

2) What is the probability of picking out a queen at random from a pack of cards?

$$\frac{4}{52} = \frac{1}{13}$$

3) Uzayr exchanged £148 for 162€. If the rate is £0.91 = 1€, how much was be charged for the transaction?

Today's Learning:

To change the subject of formulae.

Changing the Subject

Do the same thing to both sides, like solving an equation.

e.g. Change the subject of the formula to g:

Want to end with g =

Change the subject of the formula to j:

$$3 - 2m = 4j - 1$$

$$+1 \quad +1$$

$$4 - 2m = 4j$$

$$\div 4 \quad \div 4$$

$$\frac{4-2m}{4} = j$$

$$j = \frac{4-2m}{4}$$

1) $y = 2g - 5$

$$y - 5 = 2g$$

$$\div 2 \quad \div 2$$

$$\frac{y-5}{2} = g$$

$$g = \frac{y-5}{2}$$

2) $\frac{5}{g} = 2 + r$

$$5 = g(2+r)$$

$$\div (2+r) \quad \div (2+r)$$

$$\frac{5}{2+r} = g$$

3) $4 + h = 2(g + 3)$

$$4+h = 2g + 6$$

$$-6 \quad -6$$

$$-2+h = 2g$$

$$\frac{-2+h}{2} = g$$

Starter

1) At a diner, Table 8 paid £12 for a burger and two milkshakes. Table 5 paid £35.50 for 3 milkshakes and 5 burgers. Write equations and hence find the price of burgers and milkshakes at the diner.

2) Freya bought 2 Freddos and 3 Star Bars from the corner shop and paid £1.49. Fred bought 3 Freddos and 5 Star Bars from the same shop and paid £2.40. How much does the shop charge for each?

Change the subject to p:

$$4 + \frac{q}{4}$$

$$4(p^2 - 3) = 4 + q$$

If q = 4, what is the value of p?

$$p = \sqrt{\frac{16+4}{4}}$$

$$p = \sqrt{\frac{20}{4}} = \sqrt{5}$$

$$4p^2 - 12 = 4 + q$$

$$4p^2 = 16 + q$$

$$p^2 = \frac{16+q}{4}$$

$$p = \sqrt{\frac{16+q}{4}}$$

Change the subject to g.

e.g. 4) $7(2 - g) = 5m - 2$

$$\begin{aligned} 14 - 7g &= 5m - 2 \\ -7g &= 5m - 16 \\ g &= \frac{5m - 16}{-7} \end{aligned}$$

$$\begin{aligned} 5) \frac{7}{(g-2)} &= 3 \\ 7 &= 3(g-2) \\ 7 &= 3g - 6 \\ 13 &= 3g \\ g &= \frac{13}{3} \end{aligned}$$

6) $3 - r = 2 + 2g^2$

$$\begin{aligned} 1 - r &= 2g^2 \\ \frac{1-r}{2} &= g^2 \\ g &= \sqrt{\frac{1-r}{2}} \end{aligned}$$

Re-arrange for b and evaluate for when f = 2 and n = 5

1) $41 + 2f = nb^2$

$$\begin{aligned} nb^2 &= 41 + 2f \\ b^2 &= \frac{41 + 2f}{n} \\ b &= \sqrt{\frac{41 + 2f}{n}} \\ b &= \sqrt{\frac{41 + 4}{5}} = \sqrt{9} = 3 \end{aligned}$$

2) $n = \frac{5}{3}(b - f)$

$$\begin{aligned} 3n &= 5(b - f) \\ 3n &= 5b - 5f \\ 3n + 5f &= 5b \\ b &= \frac{3n + 5f}{5} = 5 \end{aligned}$$

3) Change the subject of this formula to a, and calculate the value of a when h = 13 and b = 5

$$h^2 = a^2 + b^2$$

$$a = \sqrt{h^2 - b^2}$$

4) Change the subject of the formula to k, and evaluate the change in k when a) g = 5 and b) g = 6

$$c = \frac{k(g-4)}{b}$$