Graphs of straight lines

Starter

1 **(Review of last lesson)** Two metals X and Y, of densities 23.8 g/cm^3 and 11.4 g/cm^3 respectively, are mixed to form an alloy. If 400 g of metal X and 250 g of metal Y are used, work out the density of the alloy to 3 s.f., stating the units clearly.

Working: Metal X: Density $= \dfrac{\text{Mass}}{\text{Volume}}$ $\qquad 23.8 = \dfrac{400}{\text{Volume}}$

$$\text{Volume of metal } X = \frac{400}{23.8}$$

N.B. Do not round half-way through the calculation.

Metal Y: Density $= \dfrac{\text{Mass}}{\text{Volume}}$ $\qquad 11.4 = \dfrac{250}{\text{Volume}}$

$$\text{Volume of metal } B = \frac{250}{11.4}$$

N.B. Do not round half-way through the calculation.

$$\text{Volume of alloy} = \frac{400}{23.8} + \frac{250}{11.4}$$

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}} = \frac{400 + 250}{\frac{400}{23.8} + \frac{250}{11.4}} = 16.8$$

The density of the alloy is 16.8 g/cm^3.

Horizontal and vertical straight line

Horizontal lines are of the form: $y =$ "a number" $\qquad x-\text{axis} \equiv y = 0$

Vertical lines are of the form: $x =$ "a number" $\qquad y-\text{axis} \equiv x = 0$

2. Write down the equation of the line that:
   (a) is parallel to the $x-$axis and passes through $(2, 3)$
   (b) is parallel to the $y-$axis and passes through $(7, 5)$

Working: (a) $y = 3$

(b) $x = 7$

3. Write down the coordinates where the following lines intersect:
   (a) $x = 8$ and $y = -4$ $\qquad$ (b) $y = 7$ and $x = -3$

Working: (a) $(8, -4)$

(b) $(-3, 7)$

E.g. 1 Draw the following straight line graphs

(a) $y = 2x - 5$ (b) $2y = 7x + 4$

Working:

(a) $y = 2x - 5$

Let $x = 0 \Rightarrow y = 2 \times 0 - 5 = -5$ $\therefore$ plot $(0, -5)$

Let $x = 2 \Rightarrow y = 2 \times 2 - 5 = -1$ $\therefore$ plot $(2, -1)$

Let $x = 4 \Rightarrow y = 2 \times 4 - 5 = 3$ $\therefore$ plot $(4, 3)$

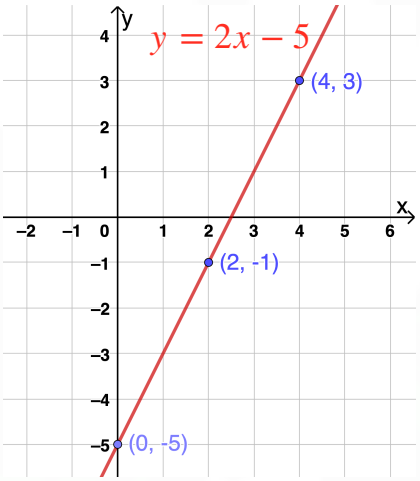
(b) $y = 2x - 5$

Let $x = 0 \Rightarrow 2y = 7 \times 0 + 4 \Rightarrow y = 2$ $\therefore$ plot $(0, 2)$

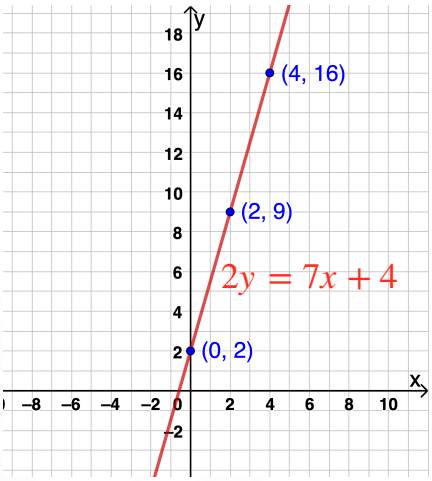
Let $x = 2 \Rightarrow 2y = 7 \times 2 + 4 \Rightarrow y = 9$ $\therefore$ plot $(2, 9)$

Let $x = 4 \Rightarrow 2y = 7 \times 4 + 4 \Rightarrow y = 16$ $\therefore$ plot $(4, 16)$

(a)



(b)



Video: x equals graphs (vertical)

Video: y equals graphs (horizontal)

Solutions to Starter and E.g.s

Exercise

9-1 class textbook:	p183 M6.8 Qu 1-6
A*-G class textbook:	p167 M6.8 Qu 1-9
9-1 homework book:	p66 M6.8 Qu 1-5
A*-G homework book:	p47 M6.8 Qu 1-5