1 T is inversely proportional to m^2

$T = 30$ when $m = 0.5$

(a) Find a formula for T in terms of m.

$T \propto \frac{1}{m^2}$

$T = \frac{k}{m^2}$, where k = constant (1)

when $T = 30$ and $m = 0.5$,

$30 = \frac{k}{(0.5)^2}$ (1)

$k = 30 \times (0.5)^2$

$= \frac{15}{2}$

$\therefore T = \frac{15}{2m^2}$ (1)

$T = \frac{15}{2m^2}$

(3)

(b) Work out the value of T when $m = 0.1$

when $m = 0.1$,

$T = \frac{15}{2(0.1)^2}$

$= 750$ (1)

750

(1)

(Total for Question 1 is 4 marks)

2

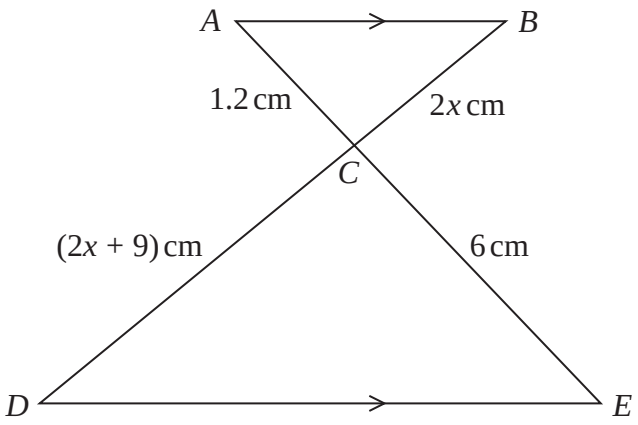

Diagram **NOT** accurately drawn

ACE and *BCD* are straight lines.
AB is parallel to *DE*

Work out the value of x

Finding scale factor of two triangles :

$\frac{6\text{ cm}}{1.2\text{ cm}} = 5$ (1)

$\therefore 5(2x) = 2x + 9$ (1)

$10x = 2x + 9$

$10 - 2x = 9$

$8x = 9$

$x = \frac{9}{8}$ (1)

$x =$ $\frac{9}{8}$

(Total for Question 2 is 3 marks)

3 Larry is a delivery man.

He has 7 parcels to deliver.
The mean weight of the 7 parcels is 2.7 kg

Larry delivers 3 of the parcels.
Each of these 3 parcels has a weight of W kg

The mean weight of the other 4 parcels is 3.3 kg

Work out the value of W

$7 \times 2.7 = 18.9$ (1)

$4 \times 3.3 = 13.2$

$3W = 18.9 - 13.2$

$3W = 5.7$ (1)

$W = \frac{5.7}{3}$

$= 1.9$ (1)

$W =$ 1.9

(Total for Question 3 is 3 marks)

Curve **L** has equation $y = x^2 + 7x + 20$

Curve **L** is transformed to curve **S** under the translation $\begin{pmatrix} 2 \\ 0 \end{pmatrix}$

4 (b) Find an equation for **S**

Give your answer in the form $y = ax^2 + bx + c$

$y = (x-2)^2 + 7(x-2) + 20$ (1)

$= x^2 - 4x + 4 + 7x - 14 + 20$ (1)

$= x^2 + 3x + 10$ (1)

(1)

$y =$ $x^2 + 3x + 10$

(4)

(Total for Question 4 is 4 marks)