

HW 7A: 4, 7, 9, 11, 13

- 4.) a.) i.) 1 hour - €6  
ii.) 2 hours - €12  
iii.) 2.5 hours - €18  
iv.) 4 hours - €24

b.) No, because there are a range of  $t$  values that have the same cost  $C$ . It is a piecewise function and not a straight line.

7.) a.) volume  $\neq$  time - Yes

b.) volume  $\neq$  height - No, the height increases at a slower rate the more the volume increases.

c.) height  $\neq$  slant height - Yes, height and slant height increase at the same rate.

d.) height  $\neq$  radius - No, the radius is proportional to the slant height, not the vertical height

e.) slant height and weight - No, the weight of water is directly proportional to volume, not slant height.

9.)  $M \propto l$ ;  $M = 40$  when  $l = 9 \times 5$

a.)  $M$  when  $l = 45$

$l$	9	45
$M$	40	200

$\therefore M = 200$

$\swarrow \times 5$

b.)  $l$  when  $M = 8$

$l$	9	$9/5$
$M$	40	8

$\therefore l = \frac{9}{5}$

$\downarrow \div 5$

11.) Actual length ( $A$ ) = 60m scaled length ( $s$ ) = 3cm

a.)  $k = \frac{60}{3} = 20$ ; 1cm = 20m on her diagram

b.)  $A = 20s \Rightarrow \frac{110}{20} = \frac{20s}{20} \Rightarrow s = \frac{11}{2} = 5.5\text{cm}$

c.)  $A = 20(15) \Rightarrow A = 300\text{m}$



13.)  $\pounds 30 + kt = C$

a.) i.  $C$  and  $t$  are not directly proportional because at time 0 the cost is  $\pounds 30$ , therefore the graph does not pass through the origin.

ii.  $(C-30)$  and  $t$  are directly proportional because this graph will pass through the origin and is a straight line.

b.)  $C = \pounds 120$  when  $t = 1.5 \rightarrow (C-30) = 120 - 30 = 90$  when  $t = 1.5$

$$\therefore \begin{array}{|c|c|c|} \hline t & 1.5 & 5 \\ \hline C-30 & 90 & x \\ \hline \end{array} \quad \frac{90}{1.5} = \frac{x}{5} \Rightarrow \frac{450}{1.5} = \frac{1.5x}{1.5}$$

$$\therefore C-30 = 300$$

$$x = 300$$

$$C = 330$$

$\pounds 330$