

$$12 \rightarrow \frac{k+10}{k-5} - \frac{10}{k} = \frac{11}{6}$$

$$6k(k+10) - 60(k-5) = 11k(k-5)$$

$$6k^2 + 60k - 60k + 300 = 11k^2 - 55k$$

$$5k^2 - 55k - 300 = 0$$

$$k^2 - 11k - 60 = 0$$

$$(k+4)(k-15) = 0$$

$$\underline{k = -4 \text{ or } k = 15}$$

12

$$\frac{3t}{t^2 - 6} = \sqrt{3}$$

$$3t = \sqrt{3}t^2 - 6\sqrt{3}$$

$$\sqrt{3}t^2 - 3t - 6\sqrt{3} = 0$$

$$t^2 - \sqrt{3}t - 6 = 0$$

$$(t + \sqrt{3})(t - 2\sqrt{3}) = 0$$

$$\underline{t = -\sqrt{3} \text{ or } t = 2\sqrt{3}}$$

$$X = (-6) - \sqrt{3} \times \sqrt{3} \times 2$$

$$+ = -\sqrt{3}$$

OR

$$\frac{3t}{t^2 - 6} = \sqrt{3}$$

$$3t = \sqrt{3}t^2 - 6\sqrt{3}$$

$$\sqrt{3}t^2 - 3t - 6\sqrt{3} = 0$$

$$X = -18$$

$$+ = -3$$

$$\sqrt{3}t^2 + 3t - 6t - 6\sqrt{3} = 0$$

$$\sqrt{3}t(t + \sqrt{3}) - 6(t + \sqrt{3}) = 0$$

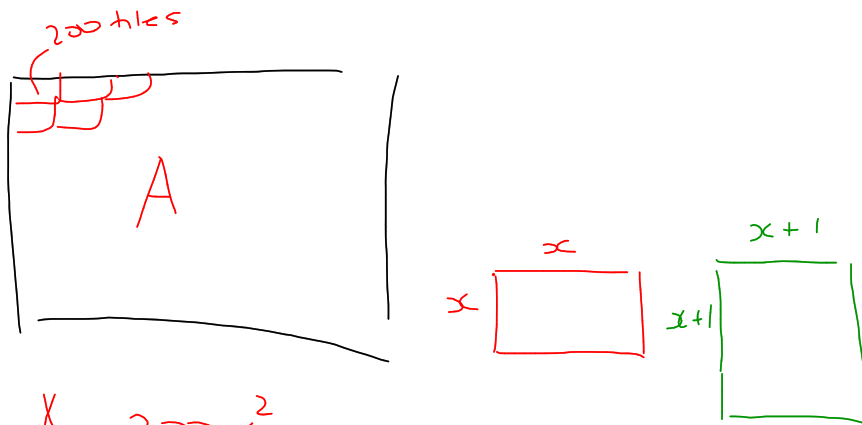
$$(t + \sqrt{3})(\sqrt{3}t - 6) = 0$$

$$t = -\sqrt{3} \text{ or } t = \frac{6}{\sqrt{3}}$$

$$= 2\sqrt{3}$$

13a)

~~13a)~~



$$A = 200x^2$$

$$A = 128(x+1)^2$$

$$200x^2 = 128x^2 + 256x + 128$$

$$72x^2 - 256x - 128 = 0$$

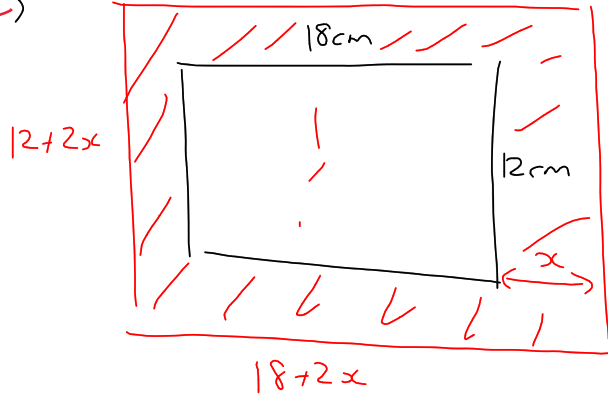
$$9x^2 - 32x - 16 = 0$$

$$(9x+4)(x-4) = 0$$

$$x = -\frac{4}{9} \text{ or } x = 4$$

$\therefore$  original tile is 4cm long

13b)  
~~13a)~~



$$(12+2x)(18+2x) = 2 \times 12 \times 18$$

~~13a)~~ 13c)

$T_A$   $\xrightarrow{330 \text{ km}}$  5 km/h faster, 30 min quicker

$T_B$   $\xrightarrow{\hspace{10em}}$

$$S_A = \frac{330}{T} = x \Rightarrow T = \frac{330}{x}$$

$$S_B = \frac{330}{T+0.5} = x-5$$

$$\frac{330}{\frac{330}{x} + 0.5} = x-5$$

$$\frac{660}{\frac{660}{x} + 1} = x-5$$

$$\frac{660}{\frac{660+x}{x}} = x-5$$

$$\frac{660x}{660+x} = x-5$$

$$660x = 660x - 3300 + x^2 - 5x$$

$$x^2 - 5x - 3300 = 0$$

$$(x + 55)(x - 60) = 0$$

$$x = -55 \text{ or } x = 60$$

14  
~~13~~b)

$$\frac{a^2 b}{x^2} + \left(1 + \frac{b}{x}\right) a = 2b + \frac{a^2}{x}$$

$$a^2 b + a x^2 + abx = 2bx^2 + a^2 x \quad , \underline{x \neq 0}$$

$$(a - 2b)x^2 + (ab - a^2)x + a^2 b = 0$$

$$\left( \begin{array}{cc} (a-2b)x & - ab \\ x & - a \end{array} \right) = 0$$

$$\underline{x = \frac{ab}{a-2b}} \quad \text{or} \quad \underline{x = a}$$