

- ⑩ distance travelled = 132 km  
 speed of passenger train =  $x$  km/h  
 speed of express train =  $(x+11)$  km/h

$$\frac{132}{x} - \frac{132}{x+11} = 1$$

$$\Rightarrow \frac{(x+11-x)132}{x^2+11x} = 1$$

$$\Rightarrow x^2+11x = 11 \times 132$$

$$\Rightarrow x^2+11x-1452=0$$

$$\Rightarrow x^2+44x-33x-1452=0$$

$$\Rightarrow x(x+44)-33(x+44)=0$$

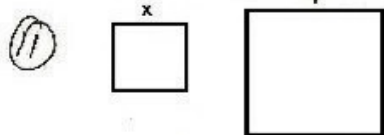
$$\Rightarrow (x+44)(x-33)=0$$

$$\Rightarrow x+44=0, x-33=0$$

$$\Rightarrow x=-44, x=33$$

*rejected*

$\therefore$  speeds of trains are 33 km/h, 44 km/h



let side of smaller sq. =  $x$  m  
 side of larger sq. =  $y$  m

acc to condition I

$$4y-4x=24$$

$$\div 4) y-x=6$$

$$\Rightarrow y=6+x \dots \textcircled{1}$$

$$x^2+y^2=468 \text{ m}^2$$

$$x^2+(6+x)^2=468$$

(using i)

$$\Rightarrow x^2+36+x^2+12x=468$$

$$\Rightarrow 2x^2+12x-432=0$$

$$\div 2) x^2+6x-216=0$$

$$\Rightarrow x^2+18x-12x-216=0$$

$$\Rightarrow x(x+18)-12(x+18)=0$$

$$\Rightarrow (x+18)(x-12)=0$$

$$\Rightarrow x+18=0, x-12=0$$

$$\Rightarrow x=-18, x=12$$

*rejected*

Sub ①

$$y=18$$

$\therefore$  sides are 12 m, 18 m