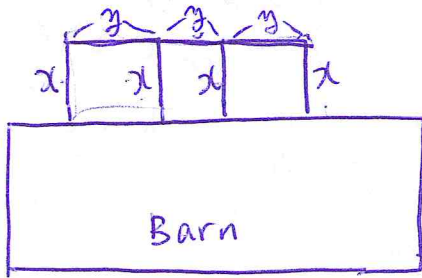


P73 #12



$$\textcircled{A} \rightarrow x \times y = \text{Area}$$

$$\textcircled{B} \rightarrow 4x + 3y = 30 \quad (\text{length of fence} = 30\text{m})$$

$$\textcircled{B}' \rightarrow 3y = 30 - 4x \rightarrow y = \frac{30 - 4x}{3}$$

Sub  $\textcircled{B}'$  into  $\textcircled{A}$

$$\textcircled{A} \rightarrow x \times \frac{30 - 4x}{3} = \text{Area}$$

$$x \times \frac{30 - 4x}{3} = 0$$

When  $x = 0$  or

$$\frac{30 - 4x}{3} = 0 \rightarrow 10 - \frac{4x}{3} = 0 \rightarrow -\frac{4x}{3} = -10$$

$$-\frac{4x}{3} \times -\frac{3}{4} = -10 \times -\frac{3}{4} \Rightarrow x = \frac{30}{4}$$

$\therefore$  Two  $x$  intercepts are 0 and  $\frac{30}{4}$

$$x \text{ coordinate of vertex} = \frac{\frac{30}{4}}{2} = \frac{30}{4 \times 2} = \frac{30}{8} = \frac{15}{4} = 3.75$$

$$\text{Sub } x = \frac{15}{4} \text{ into } \textcircled{B} \rightarrow 4\left(\frac{15}{4}\right) + 3y = 30 \rightarrow 3y = 30 - 15$$
$$3y = 15$$
$$y = 5$$

a)  $\therefore$  Dimensions, which will maximum area, are

3.75m and 5m

$$\text{b) Max area} = x \times y = 3.75 \times 5\text{m} = 18.75\text{m}^2$$