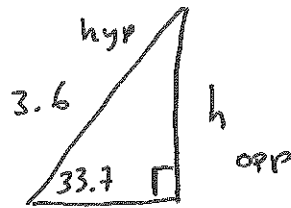
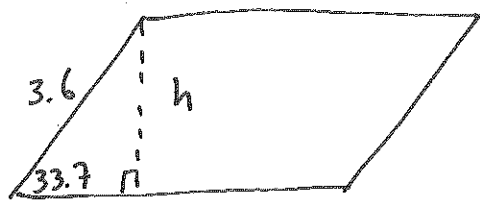


Right Angle Triangle Problem Set 1 Solutions

1.

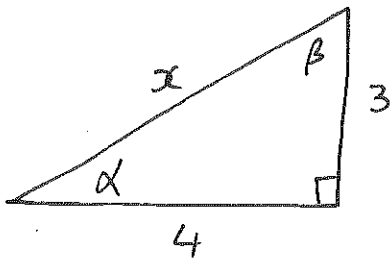


$$\sin 33.7 = \frac{h}{3.6}$$

$$h = 3.6 \sin 33.7$$
$$(\approx 1.997 \dots)$$

$$\begin{aligned} \text{Area} &= \text{base} \times \text{height} \\ &= 6 \times 3.6 \sin 33.7 \\ &= \underline{11.98} \text{ units}^2 \quad (2 \text{ d.p.}) \end{aligned}$$

2.



$$x^2 = 3^2 + 4^2$$

$$x^2 = 25$$

$$x = 5$$

$$\tan \alpha = \frac{3}{4}$$

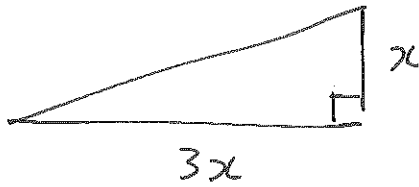
$$\begin{aligned} \alpha &= \tan^{-1}(3 \div 4) \\ &= \underline{36.9^\circ} \end{aligned}$$

$$\beta + \alpha = 90^\circ$$

$$\beta = 90 - \alpha$$

$$\beta = \underline{53.1^\circ} \quad (1 \text{ d.p.})$$

3.



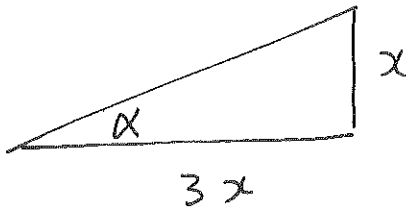
$$\text{Area} = \frac{1}{2} \text{ base} \times \text{height}$$

$$36 = \frac{1}{2} \times 3x \times x$$

$$72 = 3x^2$$

$$24 = x^2$$

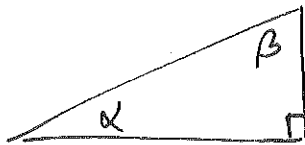
$$x = \sqrt{24} \quad (=4.9)$$



$$\alpha = \tan^{-1}\left(\frac{x}{3x}\right)$$

$$= \tan^{-1}\left(\frac{1}{3}\right)$$

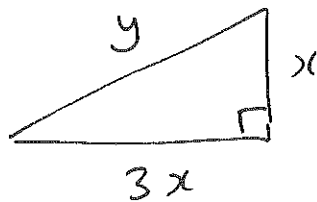
$$= \underline{18.4^\circ}$$



$$\alpha + \beta = 90$$

$$\beta = 90 - \alpha$$

$$= \underline{71.6^\circ}$$



$$y^2 = (3x)^2 + x^2$$

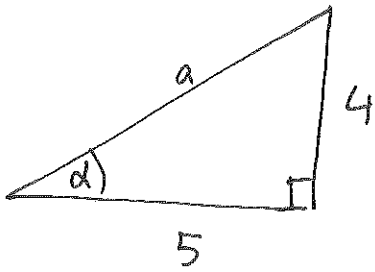
$$y^2 = 9x^2 + x^2$$

$$y^2 = 10x^2$$

$$y^2 = 10(\sqrt{24})^2 = 240$$

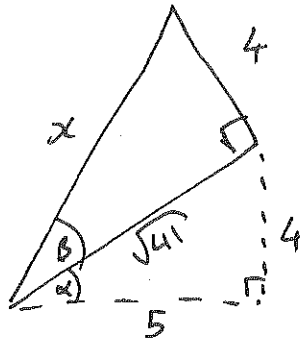
$$y = \sqrt{240} = \underline{\underline{15.5}}$$

4.



$$a^2 = 5^2 + 4^2$$

$$a = \sqrt{41}$$

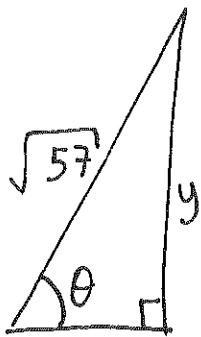


$$x^2 = (\sqrt{41})^2 + 4^2$$

$$= 41 + 16$$

$$= 57$$

$$x = \sqrt{57}$$



Lets find θ .

$$\theta = \alpha + \beta$$

$$\alpha = \tan^{-1}(4 \div 5)$$

$$\beta = \tan^{-1}(4 \div \sqrt{41})$$

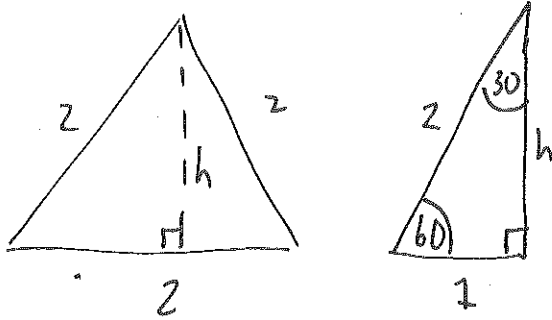
$$\theta = \alpha + \beta = 70.6526 \dots$$

$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

$$\sin \theta = \frac{y}{\sqrt{57}}$$

$$y = \sqrt{57} \sin \theta = \underline{\underline{7.1}} \quad (1 \text{ d.p.})$$

5.



$$\sin 60^\circ = \frac{h}{2}$$

$$2 \sin 60^\circ = h \quad \dots$$

Now from using pythagoras,

$$h^2 = 2^2 - 1^2$$

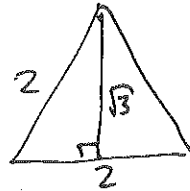
$$h^2 = 3$$

$$h = \sqrt{3}$$

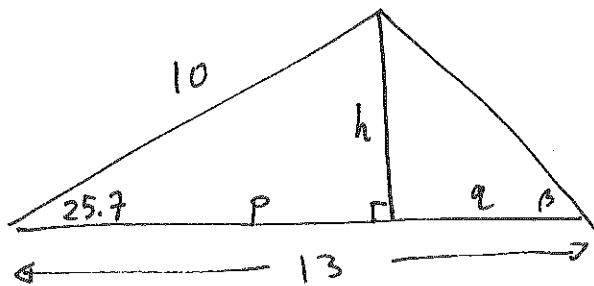
$$\text{Area} = \frac{1}{2} (\text{base})(\text{height})$$

$$= \frac{1}{2} (2) (\sqrt{3})$$

$$= \underline{\underline{\sqrt{3}}}$$



6.



$$\sin 25.7 = \frac{h}{10}$$

$$h = 10 \sin 25.7$$

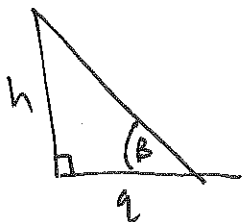
$$(= 4.3365\dots)$$

$$p^2 = 10^2 - h^2$$

$$p = 9.01077\dots$$

$$q = 13 - p$$

$$q = 3.989\dots$$



$$\beta = \tan^{-1}(h \div q)$$

$$= \underline{\underline{47.4^\circ}}$$

$$\alpha = 180 - 25.7 - 47.4 = \underline{\underline{106.9^\circ}}$$

$$x = \sqrt{h^2 + q^2}$$

$$= \underline{\underline{5.89}}$$