

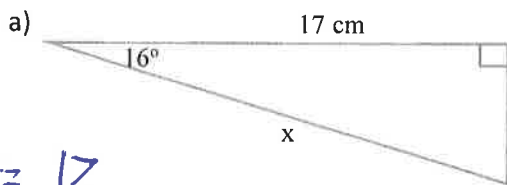
Name: _____

Marking Summary:

Total Marks: 57/60

- Knowledge/Understanding: questions #1 – 2, 4
 Application: questions #3, 5, 6, 7
 Thinking/Inquiry and Problem Solving: #8
 Communication: all

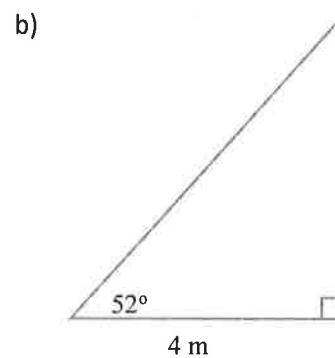
1. Solve for the length of the missing side (as indicated by the location of the variable) in each triangle below. [16 marks] *Round.*



$$\cos 16^\circ = \frac{17}{x}$$

$$x = \frac{17}{\cos 16^\circ}$$

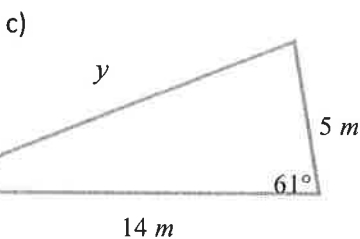
$$x \approx 17.7 \text{ cm}$$



$$\tan 52^\circ = \frac{h}{4}$$

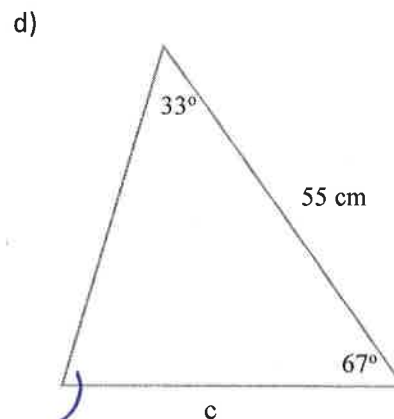
$$h = 4 \tan 52^\circ$$

$$h \approx 5.1 \text{ m}$$



$$y^2 = 14^2 + 5^2 - 2(14)(5)\cos 61^\circ$$

$$y \approx 12.4 \text{ m}$$



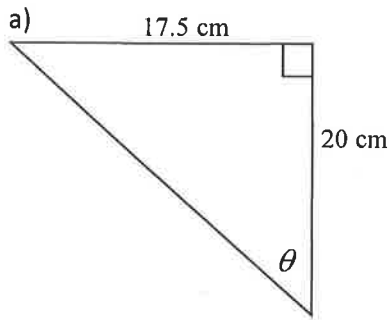
$$180 - 33 - 67 = 80^\circ$$

$$\frac{c}{\sin 33^\circ} = \frac{55}{\sin 80^\circ}$$

$$c = \frac{55 \sin 33^\circ}{\sin 80^\circ}$$

$$c \approx 30.4 \text{ cm}$$

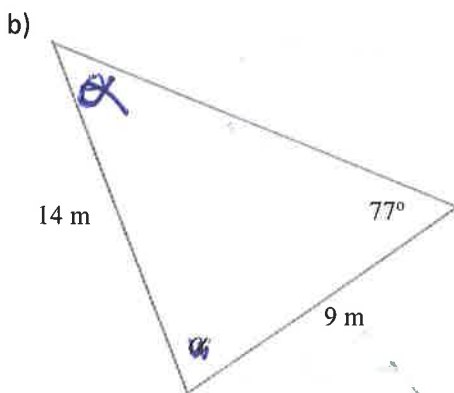
2. Each triangle below has a missing angle that you need to find (as indicated by the variable). Find the missing angle to the nearest degree. [4 marks]



$$\tan \theta = \frac{17.5}{20}$$

$$\theta = \tan^{-1}\left(\frac{17.5}{20}\right)$$

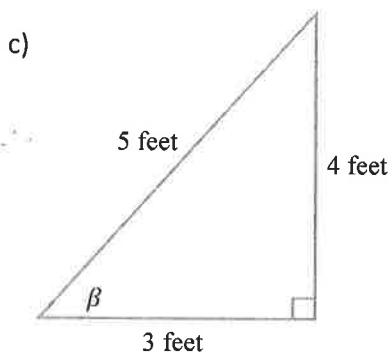
$$\theta = 41^\circ$$



$$\frac{\sin \alpha}{9} = \frac{\sin 77^\circ}{14}$$

$$\sin \alpha = \frac{9 \sin 77^\circ}{14}$$

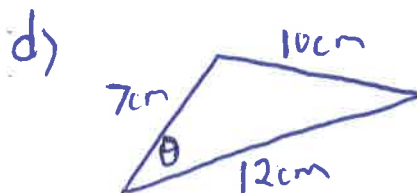
$$\alpha = 39^\circ$$



$$\sin \beta = \frac{4}{5}$$

$$\beta = \sin^{-1}\left(\frac{4}{5}\right)$$

$$\beta = 53^\circ$$

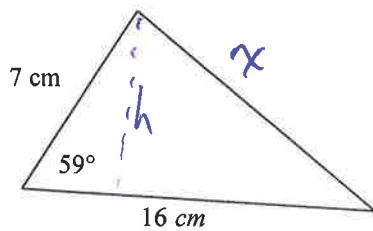


$$\cos \theta = \frac{7^2 + 12^2 - 10^2}{2(7)(12)}$$

$$\theta = 56^\circ$$

$$\cos \theta = \frac{93}{168}$$

3. Find the area and perimeter of the triangle shown below. [7 marks]



$$\sin 59^\circ = \frac{h}{7}$$

$$h = 7 \sin 59^\circ$$

$$h \approx 6 \text{ cm}$$

$$x^2 = 7^2 + 16^2 - 2(7)(16) \cos 59^\circ$$

$$x \approx 13.8 \text{ cm}$$

$$A = \frac{bh}{2}$$

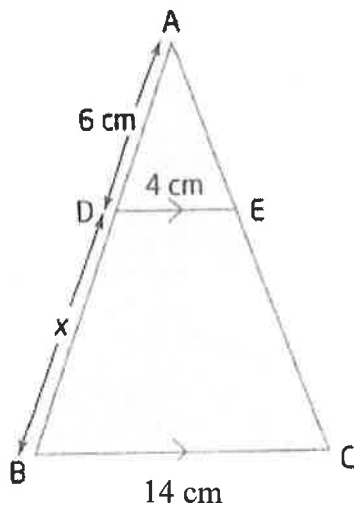
$$A = \frac{16 \text{ cm} (6 \text{ cm})}{2}$$

$$A \approx 48 \text{ cm}^2$$

$$P = 16 \text{ cm} + 7 \text{ cm} + 13.8 \text{ cm}$$

$$P \approx 36.8 \text{ cm}$$

4. Find the length of x in the diagram below. [4 marks]



$$\frac{14}{4} = \frac{x+6}{6}$$

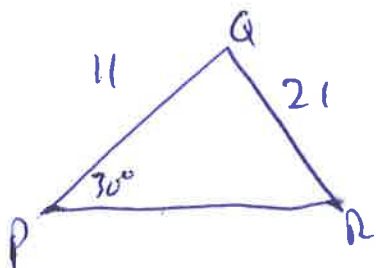
$$4x + 24 = 84$$

$$4x = 60$$

$$x = 15 \text{ cm}$$

5. Triangle PQR is such that $\angle P = 30^\circ$, $p = 21\text{cm}$ and $r = 11\text{cm}$. Solve triangle PQR.

[5 marks]



$$\frac{\sin R}{11} = \frac{\sin 30}{21}$$

$$\angle Q = 180 - 15 - 30^\circ$$

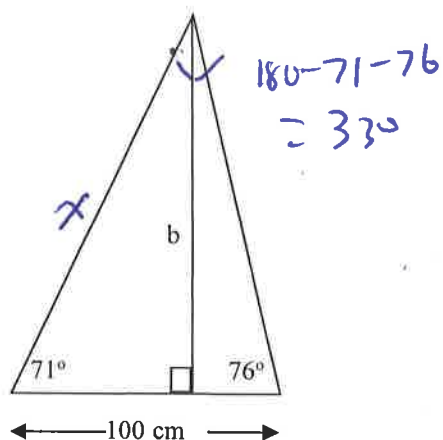
$$\angle Q = 135^\circ$$

$$R = 15^\circ$$

$$\frac{q}{\sin 135} = \frac{11}{\sin 15^\circ}$$

$$q = 30\text{cm}$$

6. Find the length of b in the figure below. [5 marks]



$$\frac{x}{\sin 76} = \frac{100}{\sin 33}$$

$$x = \frac{100 \sin 76^\circ}{\sin 33}$$

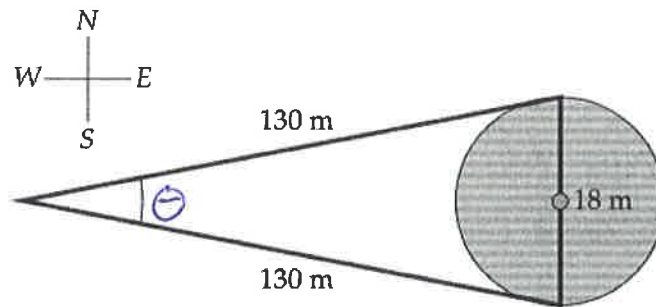
$$x = 178.15\text{cm}$$

$$\sin 71^\circ = \frac{b}{178.15}$$

$$b = 178.15 \sin 71^\circ$$

$$b = 168\text{cm}$$

7. A golf ball sits directly west of the hole which is in the centre of a circular green with diameter 18 metres. A distance of 130 metres separates the ball from both the northernmost and southernmost points on the green.



Within what angle (to the nearest degree) must the golfer hit the ball in order for it to have a chance of landing on the green?

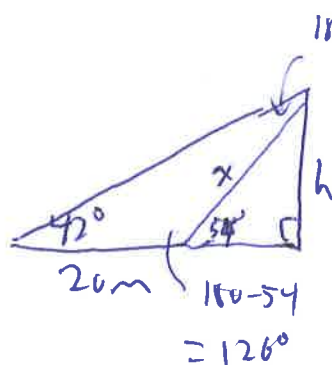
[5 marks]

$$\cos \theta = \frac{130^2 + 130^2 - 18^2}{2(130)(130)}$$

$$\theta \approx 7.9^\circ$$

$$\cos \theta = \frac{33476}{33800}$$

8. Jackie wants to estimate the height of a cliff near her house. To do this she observes the cliff from a distance and measures the angle of elevation to the top of the cliff to be 42° . She then moves 20 m closer to the base of the cliff and measures the angle of elevation to the top of the cliff to be 54° . How high is the cliff? [6 marks]



$$180 - 126 - 42 = 12^\circ$$

$$\frac{20}{\sin 12^\circ} = \frac{x}{\sin 42^\circ}$$

$$x \approx 64.37$$

$$\sin 54^\circ = \frac{h}{64.37}$$

$$h = 64.37 \sin 54^\circ$$

$$h \approx 52.1 \text{ m}$$

∴ cliff is approx 52.1 m tall.