IB Pre HL Exit Slip chapter 11 Name: Key

Calculators is allowed!! Show all your work!

1. A triangle has the measurements shown. Determine how many tringles are possible and find θ and the area of the triangle(s).

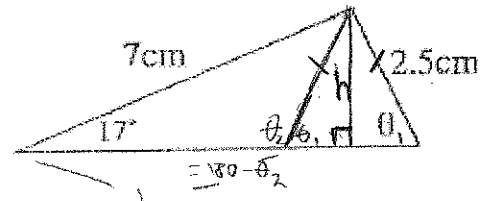
*two triangles are possible 

$$\frac{\sin\theta_1}{7} = \frac{\sin 17}{2.5}$$

$$\theta_1 = \sin^{-1}\left(\frac{7\sin 17^\circ}{2.5}\right)$$

$$\theta_1 \approx 55^\circ$$

$$\theta_2 \approx 125^\circ \quad (180-55)$$



$$A_2 = \frac{1}{2}ab\sin C$$
$$= \frac{1}{2}7(2.5)\sin(180-(17+125))$$
$$\approx 5.39\ cm^2$$

$$A_1 = \frac{1}{2}ab\sin C$$
$$= \frac{1}{2}\,7\,2.5\,\sin(180-(17+55))$$
$$= 8.32\ cm^2$$

$A =$

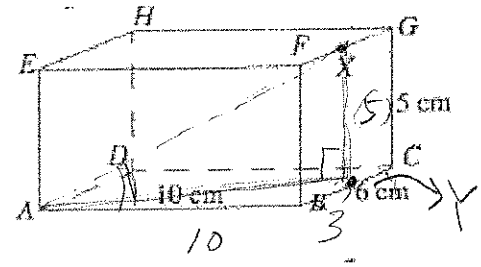
2. In the diagram alongside X is the midpoint of FG, where AB= 10 cm, BC=6cm, and CG= 5 cm. Find the angle that AX makes with the base.

Calling point right under X "Y"

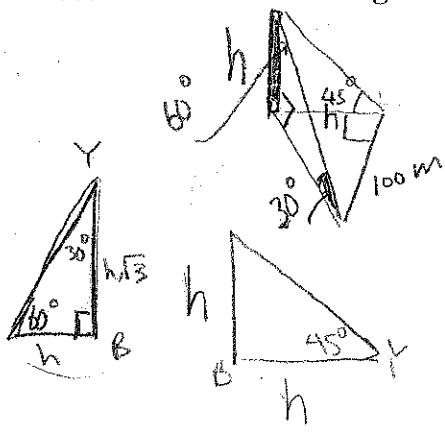
$$AY = \sqrt{10^2+3^2} = \sqrt{109}$$

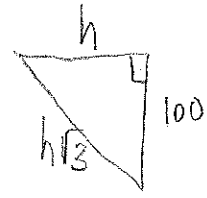
$$\tan\theta = \frac{5}{\sqrt{109}}$$

$$\theta = \tan^{-1}\left(\frac{5}{\sqrt{109}}\right) \approx 25.6^\circ$$



3. A tower stands vertically on a horizontal plane. The angles of elevation from two observes X and Y, 100 m apart, to the top of the tower are 45 degrees and 30 degrees respectively. X lies east of the tower and Y lies south of X. Find the height of the tower correct to 3 significant figures.





$$h^2 + (100)^2 = (h\sqrt{3})^2$$

$$h^2 + (100)^2 = 3h^2 \quad \text{OR}$$

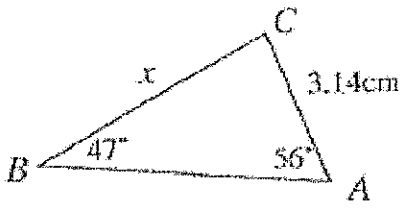
$$2h^2 = (100)^2$$

$$h = \frac{100}{\sqrt{2}} = \frac{100\cdot\sqrt{2}}{\sqrt{2}\sqrt{2}} = 50\sqrt{2}\ m$$

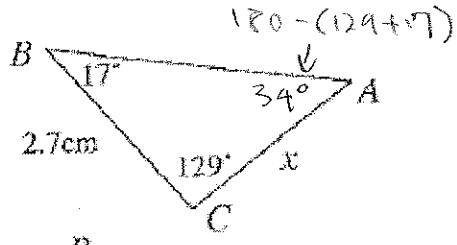
Exact

6. Solve for the unknown

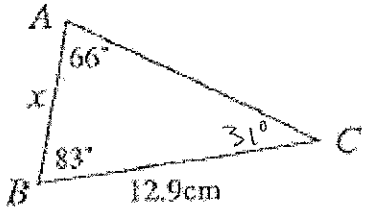
i.



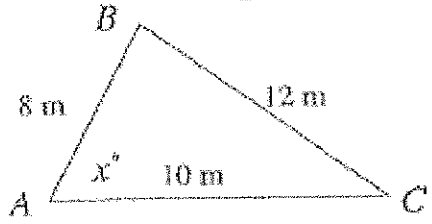
ii.



iii.



iv.



i) $\frac{x}{\sin 51} = \frac{3.14}{\sin 97}$

$x = \frac{3.14 \sin 56}{\sin 97} \approx 3.56\text{cm}$

ii) $\frac{x}{\sin 17} = \frac{2.7}{\sin 129}$

$x = \frac{2.7 \sin 17}{\sin 129} \approx 1.02\text{cm}$

iii) $\frac{x}{\sin 31} = \frac{12.9}{\sin 66}$

$x = \frac{12.9 \sin 31}{\sin 66}$

$x \approx 7.27\text{cm}$

iv) $\cos C = \frac{a^2 + b^2 - c^2}{2ab}$

$\cos C = \frac{8^2 + 10^2 - 12^2}{2(8)(10)}$

$C = \cos^{-1}\left(\frac{20}{160}\right) = \cos^{-1}\left(\frac{1}{8}\right) \approx 82.8°$

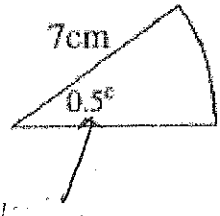
7. Find the area of the sector shown.

$A = \left(\frac{0.5}{2\pi}\right)\pi r^2$

$= \left(\frac{1}{4}\right)(7)^2 = \frac{49}{4} = 12.25\ \text{cm}^2$ Exact

OR $\approx 12.3\ (\text{m}^2)$

OR $A = \left(\frac{1}{2}\right)(0.5)(7)^2 = \frac{49}{4}$



radians