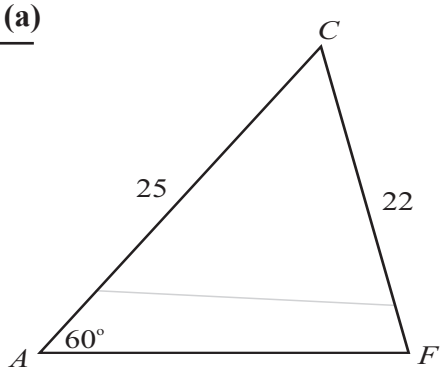
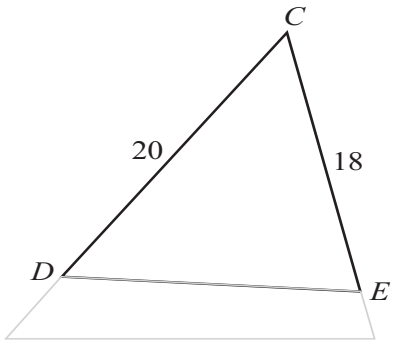
Sample Paper 2014: Paper 2

Question 8 (50 marks)

Question 8 (a)

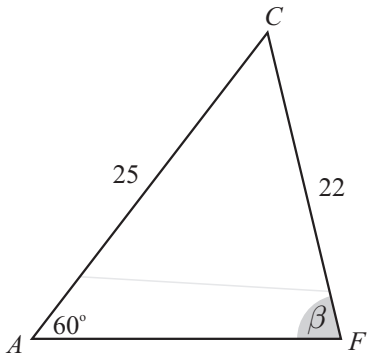




Call β the measure of $|\angle CFA|$. Use the Sine Rule to find this angle.

$$\boxed{\frac{\sin A}{a} = \frac{\sin B}{b}}$$

[Use the Sine Rule anytime you are given 2 sides and a non-included angle.]



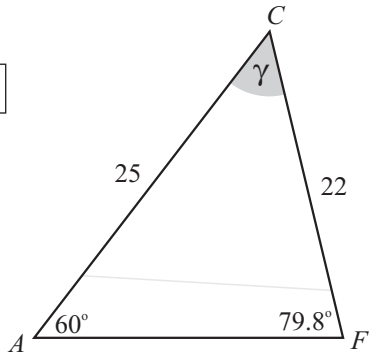
$$\frac{\sin\beta}{25} = \frac{\sin 60^\circ}{22}$$

$$\therefore \sin\beta = \frac{25\sin 60^\circ}{22}$$

$$\beta = \sin^{-1}\left(\frac{25\sin 60^\circ}{22}\right) = 79.8^\circ$$

Call γ, the measure of $|\angle ACF|$.

$$\boxed{\text{The 3 angles of a triangle add up to } 180^\circ.}$$



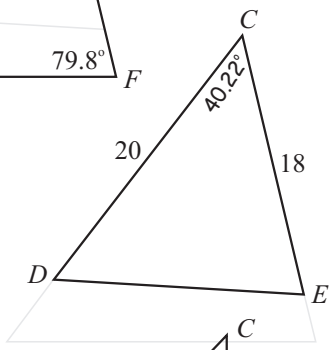
$$\gamma + 60^\circ + 79.78^\circ = 180^\circ$$

$$\gamma = 180^\circ - 60^\circ - 79.8^\circ = 40.2^\circ$$

Use the Cosine Rule to find $|DE|$.

$$\boxed{a^2 = b^2 + c^2 - 2bc\cos A}$$

[Use the Cosine Rule anytime you are given 2 sides and an included angle.]



$$|DE|^2 = 20^2 + 18^2 - 2(20)(18)\cos 40.2^\circ$$

$$|DE| = \sqrt{20^2 + 18^2 - 2(20)(18)\cos 40.2^\circ} = 13.2 \text{ cm}$$

Question 8 (b)

$\sin\alpha = \frac{22}{25} \Rightarrow \alpha = \sin^{-1}(\frac{22}{25}) = 62^\circ$

The maximum of the angle β is 90°. If it goes beyond 90° the solar panel will topple over.