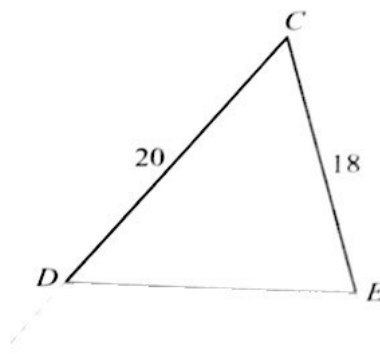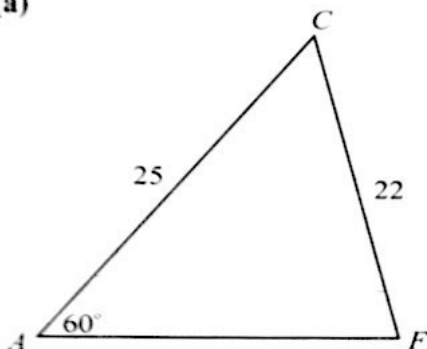## QUESTION 8 (50 MARKS)
QUESTION 8 (a)

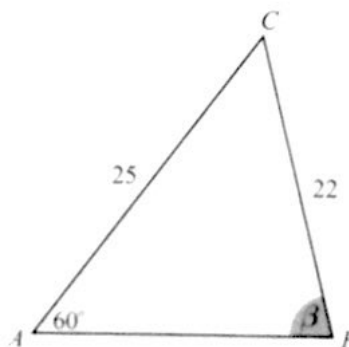Call β the measure of $|\angle CFA|$. Use the Sine Rule to find this angle.

$$\boxed{\frac{\sin A}{a} = \frac{\sin B}{b}}$$ [Use the Sine Rule anytime you are given 2 sides and a non-included angle.]

$$\frac{\sin \beta}{25} = \frac{\sin 60°}{22}$$

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

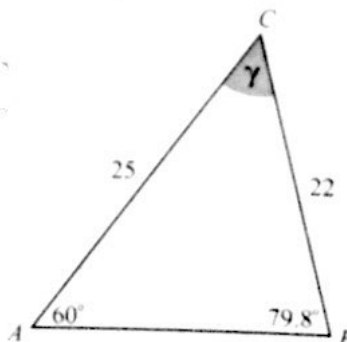$$\beta = \sin^{-1}\left(\frac{25\sin 60°}{22}\right) = 79.8°$$

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

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

$$\gamma + 60° + 79.78° = 180°$$

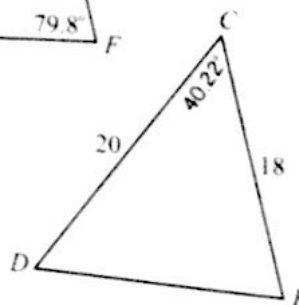$$\gamma = 180° - 60° - 79.8° = 40.2°$$

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.]

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

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

QUESTION 8 (b)

$$\sin \alpha = \tfrac{22}{25} \Rightarrow \alpha = \sin^{-1}\left(\tfrac{22}{25}\right) = 62°$$

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