

Assignment 4

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Download latex-tikz codes from

https://github.com/Bharat437/Matrix_Theory/tree/master/Assignment4

$\triangle ABF$ forms a right-angled triangle. Using cosine formula,

$$\Rightarrow \cos 60^\circ = \frac{\|AF\|}{\|AB\|} \quad (2.0.4)$$

$$= \frac{\frac{1}{2} \|AB\|}{\|AB\|} \quad (2.0.5)$$

$$\Rightarrow \cos 60^\circ = \frac{1}{2} \quad (2.0.6)$$

Hence proved.

1 QUESTION

(Geometry,1.10) Q. Using cosine formula in an equilateral triangle, show that $\cos 60^\circ = \frac{1}{2}$.

2 EXPLANATION

Consider an equilateral $\triangle ABC$ as shown in below figure:

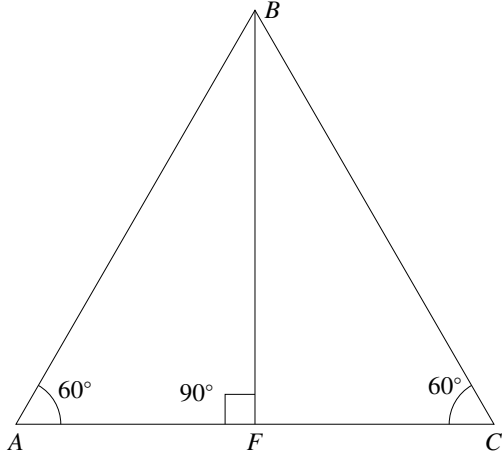


Fig. 1: Equilateral $\triangle ABC$

We know that in an equilateral triangle all sides have equal length.

$$\Rightarrow \|AB\| = \|BC\| = \|AC\| \quad (2.0.1)$$

Since F is midpoint of line AC.

$$\Rightarrow \|AF\| = \frac{1}{2} \|AC\| \quad (2.0.2)$$

From (2.0.1),

$$\Rightarrow \|AF\| = \frac{1}{2} \|AB\| \quad (2.0.3)$$