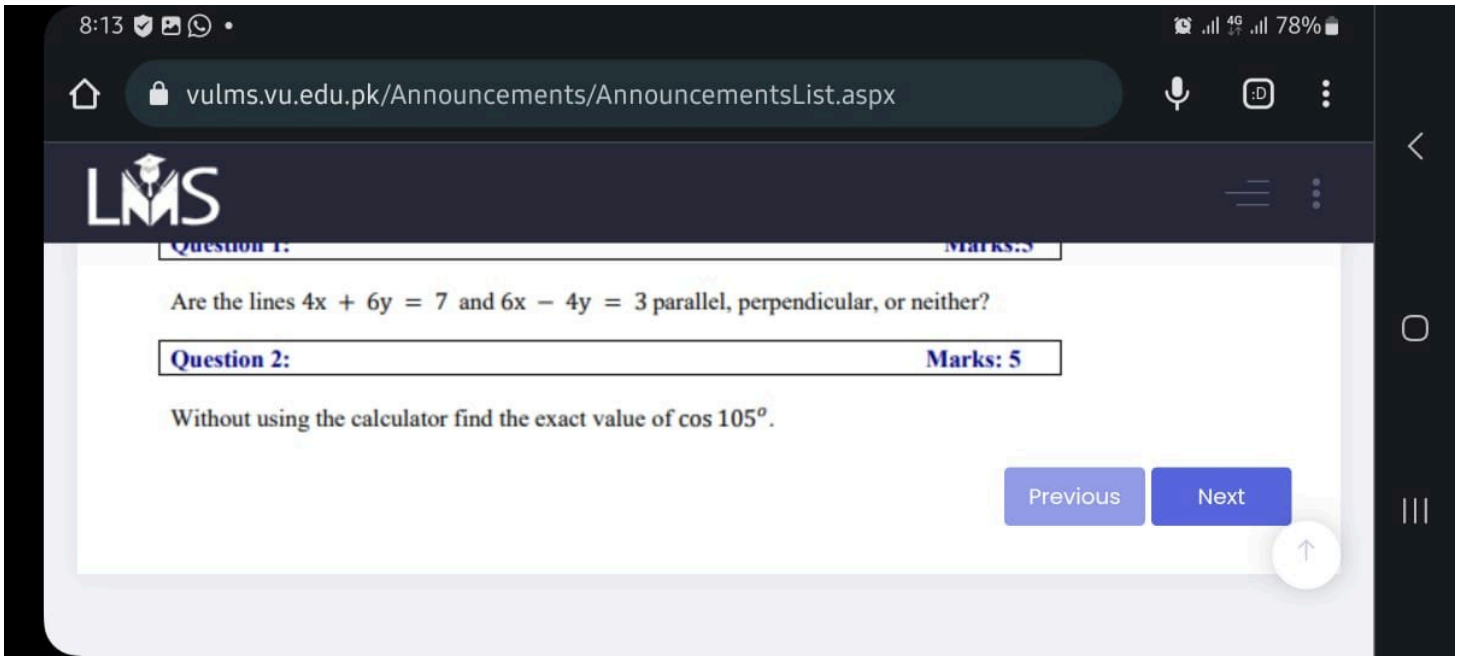

QUESTION NO. 1

Answer:-

$$4x + 6y = 7 \quad \text{---(i)}$$
$$6x - 4y = 3 \quad \text{---(ii)}$$

Two lines are parallel if and only if they have the exact same slope. And two lines are perpendicular if and only if their slopes are opposite. And if the slopes are not equal and not a opposite reciprocal then we said Neither.

NOW;

Slope of 1st equation;

$$4x + 6y = 7$$

As we Rnow that Slope line formula;

$$y = mx + c$$

$$6y = -4x + 7$$

$$y = \frac{-4x + 7}{6}$$

$$= \frac{-4}{6}x + \frac{7}{6}$$

By comparing

$$m = \frac{-4}{6}$$

$$m_1 = \frac{-2}{3}$$

Now; Second equation Slope is;

$$6x - 4y = 3$$

$$-4y = -6x + 3$$

$$y = \frac{-6x + 3}{-4}$$

$$y = \frac{-6x}{-4} + \frac{3}{-4}$$

By comparing with slope line formula;

$$y = mx + c$$

$$m = \frac{+6}{+4}$$

$$m_2 = \frac{3}{2}$$

Check;

$$m_1 = \frac{-2}{3} \text{ and } m_2 = \frac{3}{2}$$

As, $m_1 \neq m_2$ so these lines are not parallel to each other.

Since;

$$m_1 m_2 = -1$$

$$\frac{-2}{3} \times \frac{3}{2} = -1$$

$$-1 = -1$$

These line are perpendicular to each other.

2nd solution:-

$\cos(105^\circ)$

$\cos(60^\circ + 45^\circ)$

According to formula;

$\cos(\alpha + \beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$

$= \cos 60^\circ \cos 45^\circ - \sin 60^\circ \sin 45^\circ$

$= \frac{1}{2} \cdot \frac{1}{\sqrt{2}} - \frac{\sqrt{3}}{2} \cdot \frac{1}{\sqrt{2}}$

As;

$\cos 60^\circ = \frac{1}{2}$

$\cos 45^\circ = \frac{1}{\sqrt{2}}$

$\sin 60^\circ = \frac{\sqrt{3}}{2}$

$\sin 45^\circ = \frac{1}{\sqrt{2}}$

$$= \frac{1}{2\sqrt{2}} - \frac{\sqrt{3}}{2\sqrt{2}}$$

$$= \frac{1-\sqrt{3}}{2\sqrt{2}}$$ Ans:-