

النسبة المثلثية

①

الف) $\tan\left(\pi + \frac{\pi}{2}\right) + \sin\left(\pi + \frac{\pi}{2}\right) \times \cos\left(\pi + \frac{\pi}{2}\right)$



$$-1 + -\frac{\sqrt{2}}{2} \times -\frac{\sqrt{2}}{2} = -1 + \frac{1}{2} = -\frac{1}{2}$$

ب) $\tan\left(\pi + \frac{\pi}{4}\right) \times \sin\left(\pi + \frac{\pi}{4}\right) + \cos\left(\pi + \frac{\pi}{4}\right)$



$$-\frac{\sqrt{2}}{2} \times -\frac{\sqrt{2}}{2} + -\frac{1}{2} = \frac{1}{2} - \frac{1}{2} = 0$$

②



$\cos x = \frac{1}{5} = \frac{1\sqrt{10}}{5\sqrt{10}}$

$\sin x = \frac{5}{5\sqrt{10}} = \frac{1}{\sqrt{10}}$

$\frac{12\sqrt{10} - \sqrt{10}}{10} = \frac{11\sqrt{10}}{10}$

$\frac{5\sqrt{10}}{10}$

$\frac{11}{5}$

$\cos x = -\frac{1\sqrt{10}}{5} \rightarrow \frac{-12\sqrt{10} + \sqrt{10}}{10} = \frac{11}{5}$

$\sin x = -\frac{\sqrt{10}}{5}$

$\frac{-12\sqrt{10} - \sqrt{10}}{10} = \frac{11}{5}$

③

$\tan \alpha = \frac{y}{x} = \frac{1}{2}$



$\cos \alpha = \frac{2}{5} = \frac{2\sqrt{5}}{5\sqrt{5}}$

$1 + 4 = 5$

$\sin \alpha = \frac{1}{5} = \frac{\sqrt{5}}{5\sqrt{5}}$



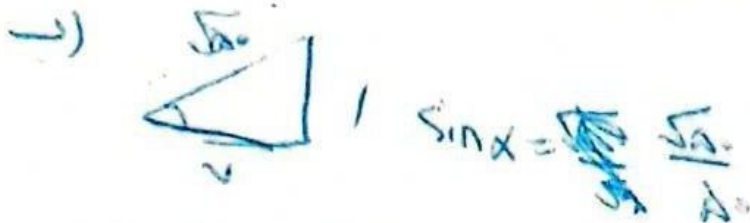
$$\cos\left(\frac{\pi}{2} + \alpha\right) = \cos\frac{\pi}{2} \times \cos\alpha -$$

$$\sin\frac{\pi}{2} \times \sin\alpha$$

$$\cos\alpha = -\frac{\sqrt{9}N}{10}$$

$$\rightarrow -\frac{\sqrt{2}}{2} \left(-\frac{\sqrt{9}N + \sqrt{2}}{10} \right) = -\frac{\sqrt{2}}{2} \left(-\frac{N\sqrt{2}}{10} \right)$$

$$= \frac{N}{10}$$



$$\sin\alpha = \frac{\sqrt{2}}{\sqrt{5}}$$

$$\cos\alpha = \frac{\sqrt{5}N}{10}$$

$$\sin\left(\frac{\pi}{2} + \alpha\right) = \sin\frac{\pi}{2} \cos\alpha$$

$$+ \cos\frac{\pi}{2} \sin\alpha$$

$$= \frac{\sqrt{2}}{2} \times \frac{\sqrt{5}N}{10} + \frac{\sqrt{2}}{2} \times \frac{\sqrt{2}}{10}$$

$$= -\frac{\sqrt{2}}{2} \left(\frac{\sqrt{5}N}{10} + \frac{\sqrt{2}}{10} \right) = -\frac{\sqrt{2}}{2} \times \frac{N\sqrt{2}}{10} = -\frac{N}{10}$$

$$\textcircled{a} \quad Y \sin^2 x = \frac{F}{2} - \cos^2 x - Y(1 - \cos^2 x) = \frac{F}{2} - \cos^2 x$$

$$\frac{\sin^2 x}{\cos^2 x} = \tan^2 x$$

$$Y - Y \cos^2 x = \frac{F}{2} - \cos^2 x$$

$$\frac{Y}{2} = \cos^2 x$$

$$\Rightarrow \sin^2 x = 1 - \frac{Y}{2} = \frac{1}{2}$$

$$\frac{1}{2} = \frac{1}{2}$$

④

$$S = \frac{1}{2} ab \sin A$$



$$\frac{1}{2} \times 5\sqrt{2} \times 9 \times \sin A = 18$$

$$\sin A = \frac{4}{9}$$



⑤



$$\sin A = \frac{1}{2}$$

$$\frac{1}{2} \times 12 \times 10 \times \sin A = 18$$

$$12 = 18 \rightarrow 2 = \frac{18}{12} \rightarrow 45^\circ$$

$$P(45^\circ + 95^\circ) = 140^\circ$$

⑥

$$\frac{1}{2} \times V \times a \times \sin A = \frac{1}{2} \times V \times x \times \sin A = 1, 1, 1$$

$$\sin A = 1$$

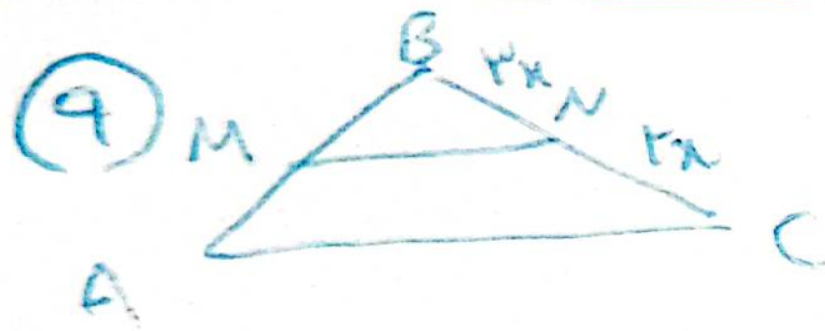
$$\sin A = 1 \rightarrow A = 90^\circ$$

$$\sin A = 1 \rightarrow A = 90^\circ$$

$$\sin A = 1$$

$$\tan A = \frac{1}{1} = 1$$





$$\frac{2}{c} \times \frac{AB}{BM} = \frac{1}{2}$$

$$S_{ABC} = \frac{1}{2} AB \times AC \sin B$$

$$S_{BMN} = \frac{1}{2} BM \times MN \sin B$$

$$\frac{AB}{BM} = \frac{9}{2} \rightarrow \frac{BM}{AM} = \frac{2}{7}$$

$$1 = \frac{1}{2}$$

$$1$$

(10)

$$\frac{1}{\sec \alpha} = \frac{1}{|\cos \alpha|}$$

$$\frac{1}{|\cos \alpha|} + \frac{1 - \sin \alpha}{|\cos \alpha|} - \frac{\sin \alpha}{\cos \alpha} = 0$$

$$-\sin \alpha \left(\frac{1}{\cos \alpha} + \frac{1}{|\cos \alpha|} \right) = 0$$

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$$\rightarrow \cos \alpha < 0 \quad \text{I}$$

$$\frac{|\sin \alpha|}{\cos \alpha} = -\frac{1}{\cot \alpha} \rightarrow \cot \alpha > 0 \quad \text{II}$$

I, II $\Rightarrow$

