

# Solutions of Worksheet-5

Class - IX  
MATHS

A-5.

1(i)  $\therefore \tan 30^\circ = \frac{P}{B}$

$\therefore \tan 30^\circ = \frac{20}{x}$

$\frac{1}{\sqrt{3}} = \frac{20}{x}$  or  $x = 20\sqrt{3}$   
 $x = 20 \times 1.732$   
 $x = 34.640$   
 $x = 34.64 \checkmark$

(ii)  $\therefore \tan 30^\circ = \frac{P}{B}$

$\therefore \frac{1}{\sqrt{3}} = \frac{x}{60}$

$\sqrt{3}x = 60$

$x = \frac{60}{\sqrt{3}}$

$x = \frac{60}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{60\sqrt{3}}{3}$

$x = 20\sqrt{3} = 34.64 \checkmark$

2(i)  $\therefore \cos A = \frac{b}{H} = \frac{10}{20}$

$\therefore \cos A = \frac{1}{2}$

$\cos A = \cos 60^\circ$

$\therefore A = 60^\circ \checkmark$

(ii)  $\therefore \tan A = \frac{P}{B}$

$\therefore \tan A = \frac{10\sqrt{3}}{10}$

$\tan A = \tan 60^\circ$

$\therefore A = 60^\circ \checkmark$

3.) In rt  $\Delta \Delta \Delta AP$ ,  $\tan 30^\circ = \frac{P}{B}$

$\frac{1}{\sqrt{3}} = \frac{10}{AP}$

$AP = 10\sqrt{3} = 10 \times 1.732$   
 $= 17.32 \text{ cm}$

In rt  $\Delta \Delta \Delta PBR$

$\tan 45^\circ = \frac{P}{B} \Rightarrow 1 = \frac{PB}{B}$

$PB = 8 \text{ cm}$

$\therefore AB = AP + PB \Rightarrow 17.32 + 8$   
 $= 25.32 \text{ cm} \checkmark$

4. Evaluate:  $\frac{2 \tan 53^\circ}{\cot 37^\circ} - \frac{\cot 80^\circ}{\tan 10^\circ}$

(i)

$= \frac{2 \tan(90^\circ - 37^\circ)}{\cot 37^\circ} - \frac{\cot(90^\circ - 10^\circ)}{\tan 10^\circ}$

$= \frac{2 \cot 37^\circ}{\cot 37^\circ} - \frac{\tan 10^\circ}{\tan 10^\circ}$

$= 2 - 1 = 1 \checkmark$

(ii)  $3 \cos 80^\circ \operatorname{cosec} 10^\circ + 2 \sin 59^\circ \sec 31^\circ$

$= 3 \cos 80^\circ \times \frac{1}{\sin 10^\circ} + 2 \sin 59^\circ \times \frac{1}{\cos 31^\circ}$

$= 3 \frac{\cos(90^\circ - 10^\circ)}{\sin 10^\circ} + 2 \frac{\sin(90^\circ - 31^\circ)}{\cos 31^\circ}$

$= \frac{3 \sin 10^\circ}{\sin 10^\circ} + 2 \frac{\cos 31^\circ}{\cos 31^\circ} \Rightarrow 3 + 2 = 5 \checkmark$

(iii)  $\tan 10^\circ \tan 15^\circ \tan 75^\circ \tan 80^\circ$

$= \tan 10^\circ \tan 80^\circ \cdot \tan 15^\circ \tan 75^\circ$

$= \tan(90^\circ - 80^\circ) \tan 80^\circ \cdot \tan(90^\circ - 75^\circ) \tan 75^\circ$

$= \cot 80^\circ \tan 80^\circ \cdot \cot 75^\circ \tan 75^\circ$

$= \frac{1}{\tan 80^\circ} \times \tan 80^\circ \cdot \frac{1}{\tan 75^\circ} \times \tan 75^\circ$

$= 1 \checkmark$

(iv)  $\frac{\cos(90^\circ - 20^\circ)}{\sin 20^\circ} + \frac{\cos(90^\circ - 31^\circ)}{\sin 31^\circ} - 8 \times \left(\frac{1}{2}\right)^2$

$= \frac{\sin 20^\circ}{\sin 20^\circ} + \frac{\sin 31^\circ}{\sin 31^\circ} - 8 \times \frac{1}{4}$

$= 1 + 1 - 2 = 0 \checkmark$

(v)  $\sec(90^\circ - 20^\circ) \sin 20^\circ + \operatorname{cosec} 20^\circ \operatorname{cosec}(90^\circ - 20^\circ)$

$= \operatorname{cosec} 20^\circ \sin 20^\circ + \operatorname{cosec} 20^\circ \sec 20^\circ$

$= \frac{1}{\sin 20^\circ} \times \sin 20^\circ + \operatorname{cosec} 20^\circ \times \frac{1}{\cos 20^\circ}$

$= 1 + 1$

$= 2 \checkmark$