# RS Aggarwal Solutions for Class 10 Maths Chapter 11–T Ratios Of Some Particular Angles

**Class 10 - Chapter 11 T Ratios Of Some Particular Angles**

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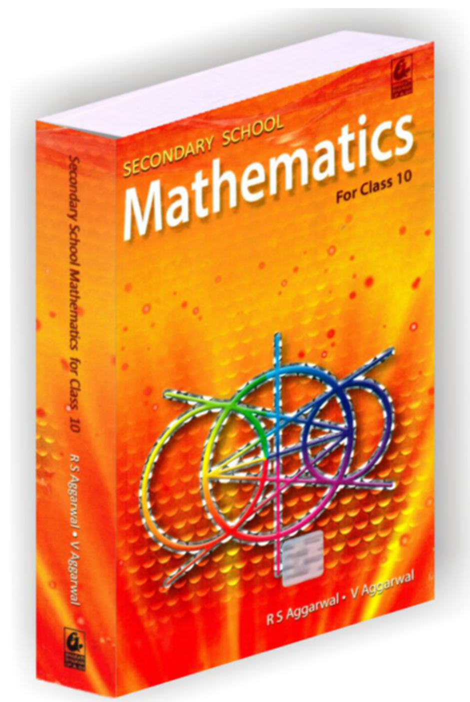


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# RS Aggarwal Solutions for Class 10 Maths Chapter 11–T Ratios Of Some Particular Angles

Class 10: Maths Chapter 11 solutions. Complete Class 10 Maths Chapter 11 Notes.

## RS Aggarwal Solutions for Class 10 Maths Chapter 11–T Ratios Of Some Particular Angles

RS Aggarwal 10th Maths Chapter 11, Class 10 Maths Chapter 11 solutions

**Question 1.**

**Solution:**

On substituting the value of various T-ratios, we get

sin60° cos30° + cos60° sin30°

$$= \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2} + \frac{1}{2} \times \frac{1}{2} = \frac{3}{4} + \frac{1}{4} = \frac{4}{4} = 1$$

**Question 2.**

**Solution:**

On substituting the value of various T-ratios, we get

cos60° cos30° – sin60° sin30°

$$= \frac{1}{2} \times \frac{\sqrt{3}}{2} - \frac{\sqrt{3}}{2} \times \frac{1}{2}$$
$$= \frac{\sqrt{3}}{4} - \frac{\sqrt{3}}{4}$$
$$= 0$$

**Question 3.**

**Solution:**

On substituting the value of various Tratios, we get

cos45° cos30° + sin45° sin30°

$$= \frac{1}{\sqrt{2}} \times \frac{\sqrt{3}}{2} + \frac{1}{\sqrt{2}} \times \frac{1}{2} = \frac{\sqrt{3}}{2\sqrt{2}} + \frac{1}{2\sqrt{2}} = \frac{\sqrt{3}+1}{2\sqrt{2}}$$

**Question 4.**

**Solution:**

On substituting the value of various Tratios, we get

$$\frac{\sin 30^\circ}{\cos 45^\circ} + \frac{\cot 45^\circ}{\sec 60^\circ} - \frac{\sin 60^\circ}{\tan 45^\circ} - \frac{\cos 30^\circ}{\sin 90^\circ}$$

$$= \frac{\left(\frac{1}{2}\right)}{\left(\frac{1}{\sqrt{2}}\right)} + \frac{1}{\left(\frac{2}{1}\right)} - \frac{\left(\frac{\sqrt{3}}{2}\right)}{1} - \frac{\left(\frac{\sqrt{3}}{2}\right)}{1}$$

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

$$= \left(\frac{\sqrt{2}+1-2\sqrt{3}}{2}\right)$$

**Question 5.**

**Solution:**

$$\frac{5\cos^2 60^\circ + 4\sec^2 30^\circ - \tan^2 45^\circ}{\sin^2 30^\circ + \cos^2 30^\circ}$$

$$= \frac{5\left(\frac{1}{2}\right)^2 + 4\left(\frac{2}{\sqrt{3}}\right)^2 - (1)^2}{\left(\frac{1}{2}\right)^2 + \left(\frac{\sqrt{3}}{2}\right)^2}$$

$$= \frac{5 \times \frac{1}{4} + 4 \times \frac{4}{3} - 1}{\frac{1}{4} + \frac{3}{4}}$$

$$= \frac{\frac{5}{4} + \frac{16}{3} - 1}{\frac{1+3}{4}}$$

$$= \frac{\frac{15 + 64 - 12}{12}}{\frac{4}{4}}$$

$$= \frac{\frac{67}{12}}{1}$$

$$= \frac{67}{12}$$

**Question 6.**

**Solution:**

On substituting the value of various Tratios, we get

$$2\cos^2 60^\circ + 3\sin^2 45^\circ - 3\sin^2 30^\circ + 2\cos^2 90^\circ$$

$$= 2 \times \left(\frac{1}{2}\right)^2 + 3 \times \left(\frac{1}{\sqrt{2}}\right)^2 - 3 \times \left(\frac{1}{2}\right)^2 + 2(0)^2$$

$$= \frac{1}{2} + \frac{3}{2} - \frac{3}{4} \Rightarrow \frac{2 + 6 - 3}{4} = \frac{5}{4}$$

**Question 7.**

**Solution:**

On substituting the value of various Tratios, we get

$$\cot^2 30^\circ - 2\cos^2 30^\circ - \frac{3}{4}\sec^2 45^\circ + \frac{1}{4}\operatorname{cosec}^2 30^\circ$$
$$= \left(\sqrt{3}\right)^2 - 2\times\left(\frac{\sqrt{3}}{2}\right)^2 - \frac{3}{4}\times\left(\frac{\sqrt{2}}{1}\right)^2 + \frac{1}{4}\times(2)^2$$
$$= 3 - 2\times\frac{3}{4} - \frac{3}{4}\times 2 + \frac{1}{4}\times 4$$
$$= 3 - \frac{3}{2} - \frac{3}{2} + 1$$
$$= \frac{6-3-3+2}{2}$$
$$= \frac{2}{2} = 1$$

**Question 8.**

**Solution:**

On substituting the value of various Tratios, we get

$$\left(\sin^2 30^\circ + 4\cot^2 45^\circ - \sec^2 60^\circ\right)\left(\operatorname{cosec}^2 45^\circ \sec^2 30\right)$$
$$= \left[\left(\frac{1}{2}\right)^2 + 4\times(1)^2 - (2)^2\right]\left[\left(\sqrt{2}\right)^2 \times \left(\frac{2}{\sqrt{3}}\right)^2\right]$$
$$= \left(\frac{1}{4} + 4 - 4\right)\left(2\times\frac{4}{3}\right)$$
$$= \frac{1}{4}\times\frac{8}{3} = \frac{2}{3}$$

**Question 9.**

**Solution:**

On substituting the value of various Tratios, we get

$$\frac{4}{\cot^2 30°}+\frac{1}{\sin^2 30°}-2\cos^2 45°-\sin^2 0°$$
$$=\frac{4}{\left(\sqrt{3}\right)^2}+\frac{1}{\left(\frac{1}{2}\right)^2}-2\times\left(\frac{1}{\sqrt{2}}\right)^2-0$$
$$=\frac{4}{3}+\frac{4}{1}-\frac{2}{2}-0$$
$$=\frac{8+24-6-0}{6}$$
$$=\frac{26}{6}=\frac{13}{3}$$

**Question 10.**

**Solution:**

(i)

$$\text{L.H.S.}=\frac{1-\sin 60°}{\cos 60°}=\frac{1-\frac{\sqrt{3}}{2}}{\frac{1}{2}}=\frac{2-\sqrt{3}}{1}$$

$$\text{R.H.S.}=\frac{\tan 60°-1}{\tan 60°+1}=\frac{\sqrt{3}-1}{\sqrt{3}+1}\times\frac{\sqrt{3}-1}{\sqrt{3}-1}$$
$$=\frac{\left(\sqrt{3}-1\right)^2}{\left(\sqrt{3}\right)^2-(1)^2}$$
$$=\frac{3+1-2\sqrt{3}}{3-1}$$
$$=\frac{4-2\sqrt{3}}{2}$$
$$=\frac{2\left(2-\sqrt{3}\right)}{2}$$
$$=\left(2-\sqrt{3}\right)$$
L.H.S. = R.H.S.

Hence, $\frac{1-\sin 60°}{\cos 60°}=\frac{\tan 60°-1}{\tan 60°+1}$

(ii)

$$\text{L.H.S.} = \frac{\cos 30^\circ + \sin 60^\circ}{1 + \sin 30^\circ + \cos 60^\circ} = \frac{\frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2}}{1 + \frac{1}{2} + \frac{1}{2}} = \frac{\sqrt{3}}{2}$$

$$\text{R.H.S.} = \cos 30^\circ = \frac{\sqrt{3}}{2}$$

L.H.S = R.H.S.

$$\text{hence, } \frac{\cos 30^\circ + \sin 60^\circ}{1 + \sin 30^\circ + \cos 60^\circ} = \cos 30^\circ$$

**Question 11.**

**Solution:**

(i)

$$\text{L.H.S.} = \sin 60^\circ \cos 30^\circ - \cos 60^\circ \sin 30^\circ$$

$$= \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2} - \frac{1}{2} \times \frac{1}{2} \Rightarrow \frac{3}{4} - \frac{1}{4} = \frac{2}{4} = \frac{1}{2}$$

$$\text{R.H.S.} = \sin 30^\circ = \frac{1}{2}$$

R.H.S. = L.H.S.

Hence, sin60° cos30° – cos60° sin30° = sin30°

(ii)

L.H.S. = cos60° cos30° + sin60° sin30°

$$= \frac{1}{2} \times \frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} \times \frac{1}{2} = \frac{\sqrt{3}}{4} + \frac{\sqrt{3}}{4} = \frac{\sqrt{3}}{2}$$

$$\text{R.H.S.} = \cos 30^\circ = \frac{\sqrt{3}}{2}$$

$\therefore$ L.H.S = R.H.S

Hence, $\cos 60^\circ \cos 30^\circ + \sin 60^\circ \sin 30^\circ = \cos 30^\circ$

$$\tan(A+B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$$

$$\tan(A+B) = \frac{\left(\frac{1}{3} + \frac{1}{2}\right)}{1 - \frac{1}{3} \times \frac{1}{2}} \quad \left[\because \tan A = \frac{1}{3}, \tan B = \frac{1}{2}\right]$$

$$= \frac{\left(\frac{5}{6}\right)}{\left(\frac{5}{6}\right)} = \frac{5}{6} \times \frac{6}{5} = 1$$

$$\tan(A+B) = 1 \Rightarrow \tan(A+B) = \tan 45^\circ$$

(iii)

$$\text{LHS} = 2 \sin 30^\circ \cos 30^\circ \Rightarrow 2 \times \frac{1}{2} \times \frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{2}$$

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

R.H.S. = L.H.S.

Hence,2sin30° cos30° = sin60°

(iv)

$$\text{LHS} = 2 \sin 45^\circ \cos 45^\circ = 2 \times \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}} = 1$$

R.H.S. = sin90° = 1

R.H.S. = L.H.S.

Hence, 2 sin 45° cos45° = sin90°

**Question 12.**

**Solution:**

A = 45° 2 A = 90°

(i)Sin 2A = sin90° = 1

$$\therefore \quad 2\sin A\cos A = 2\sin 45^\circ \cos 45^\circ = 2\times\frac{1}{\sqrt{2}}\times\frac{1}{\sqrt{2}} = 1$$

$$\therefore \quad \sin 2A = 2\sin A\cos A$$

(ii) cos2A = cos90° = 0

$$2\cos^2 A - 1 = 2\cos^2 45^\circ - 1$$
$$= 2\left(\frac{1}{\sqrt{2}}\right)^2 - 1 = 1 - 1 = 0$$
$$1 - 2\sin^2 A = 1 - 2\sin^2 45^\circ = 1 - 2\times\left(\frac{1}{\sqrt{2}}\right)^2 = 1 - 1 = 0$$
$$\therefore \cos 2A = 2\cos^2 A - 1 = 1 - 2\sin^2 A$$

**Question 13.**

**Solution:**

A = 30 ⇒ 2A = 60

(i)

$$\sin 2A = \sin 60° = \frac{\sqrt{3}}{2}$$

$$\text{Also} \quad \frac{2\tan A}{1+\tan^2 A} = \frac{2\tan 30°}{1+\tan^2 30} = \frac{2\times\frac{1}{\sqrt{3}}}{1+\left(\frac{1}{\sqrt{3}}\right)^2} = \frac{\frac{2}{\sqrt{3}}}{1+\frac{1}{3}}$$

$$= \frac{\frac{2}{\sqrt{3}}}{\frac{4}{3}} = \frac{2}{\sqrt{3}}\times\frac{3}{4} = \frac{\sqrt{3}}{2}$$

$$\text{Hence, } \sin 2A = \frac{2\tan A}{1+\tan^2 A}$$

(ii)

$$\cos 2A = \cos 60° = \frac{1}{2}$$

$$\text{Also, } \frac{1-\tan^2 A}{1+\tan^2 A} = \frac{1-\tan^2 30°}{1+\tan^2 30°} = \frac{1-\left(\frac{1}{\sqrt{3}}\right)^2}{1+\left(\frac{1}{\sqrt{3}}\right)^2}$$

$$= \frac{\left(1-\frac{1}{3}\right)}{\left(1+\frac{1}{3}\right)} = \frac{\left(\frac{2}{3}\right)}{\left(\frac{4}{3}\right)} = \left(\frac{2}{3}\times\frac{3}{4}\right) = \frac{1}{2}$$

$$\text{Hence, } \cos 2A = \frac{1-\tan^2 A}{1+\tan^2 A}$$

(iii)

$\tan 2A = \tan 60° = \sqrt{3}$

Also, $\dfrac{2\tan A}{1-\tan^2 A} = \dfrac{2\tan 30°}{1-\tan^2 30°} = \dfrac{2\times\frac{1}{\sqrt{3}}}{1-\left(\frac{1}{\sqrt{3}}\right)^2} = \dfrac{2\times\frac{1}{\sqrt{3}}}{1-\frac{1}{3}}$

$= \dfrac{\left(\frac{2}{\sqrt{3}}\right)}{\left(\frac{2}{3}\right)} = \left(\dfrac{2}{\sqrt{3}}\times\dfrac{3}{2}\right) = \sqrt{3}$

Hence, $\tan 2A = \dfrac{2\tan A}{1-\tan^2 A}$

**Question 14.**

**Solution:**

(i)

$A = 60°$ and $B = 30°$

$\Rightarrow A + B = 60° + 30° = 90°$

$\therefore\ \sin(A+B) = \sin 90° = 1$

And, $\sin A\ \cos B + \cos A\ \sin B = \sin 60° \cos 30° + \cos 60° \sin 30°$

$= \dfrac{\sqrt{3}}{2}\times\dfrac{\sqrt{3}}{2} + \dfrac{1}{2}\times\dfrac{1}{2}$

$= \dfrac{3}{4} + \dfrac{1}{4}$

$= \dfrac{3+1}{4}$

$= \dfrac{4}{4}$

$= 1$

$\therefore\ \sin(A+B) = \sin A\cos B + \cos A\sin B$

(ii)

$A = 60^\circ$ and $B = 30^\circ$

$\Rightarrow A + B = 60^\circ + 30^\circ = 90^\circ$

$\therefore \cos(A + B) = \cos 90^\circ = 0$

And, $\cos A \cos B - \sin A \sin B = \cos 60^\circ \cos 30^\circ - \sin 60^\circ \sin 30^\circ$

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

$$= \frac{\sqrt{3}}{4} - \frac{\sqrt{3}}{4}$$

$$= 0$$

$\therefore \cos(A + B) = \cos A \cos B - \sin A \sin B$

**Question 15.**

**Solution:**

(i)

$A = 60^\circ$ and $B = 30^\circ$

$\Rightarrow A - B = 60^\circ - 30^\circ = 30^\circ$

$\therefore \sin(A - B) = \sin 30^\circ = \frac{1}{2}$

And, $\sin A \cos B - \cos A \sin B = \sin 60^\circ \cos 30^\circ - \cos 60^\circ \sin 30^\circ$

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

$$= \frac{3}{4} - \frac{1}{4}$$

$$= \frac{3-1}{4}$$

$$= \frac{2}{4}$$

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

$\therefore \sin(A - B) = \sin A \cos B - \cos A \sin B$

(ii)

$A = 60^\circ$ and $B = 30^\circ$

$\Rightarrow A - B = 60^\circ - 30^\circ = 30^\circ$

$\therefore \cos(A - B) = \cos 30^\circ = \frac{\sqrt{3}}{2}$

And, $\cos A \cos B + \sin A \sin B = \cos 60^\circ \cos 30^\circ + \sin 60^\circ \sin 30^\circ$

$$= \frac{1}{2} \times \frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} \times \frac{1}{2}$$

$$= \frac{\sqrt{3}}{4} + \frac{\sqrt{3}}{4}$$

$$= \frac{2\sqrt{3}}{4}$$

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

$\therefore \cos(A - B) = \cos A \cos B + \sin A \sin B$

(iii)

$A = 60^\circ$ and $B = 30^\circ$

$\Rightarrow A - B = 60^\circ - 30^\circ = 30^\circ$

$\therefore \tan(A - B) = \tan 30^\circ = \frac{1}{\sqrt{3}}$

$$\text{And, } \frac{\tan A - \tan B}{1 + \tan A \tan B} = \frac{\tan 60^\circ - \tan 30^\circ}{1 + \tan 60^\circ \tan 30^\circ}$$

$$= \frac{\sqrt{3} - \frac{1}{\sqrt{3}}}{1 + \sqrt{3} \times \frac{1}{\sqrt{3}}}$$

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

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

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

$$\therefore \tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$$

**Question 16.**

**Solution:**

$$\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$$

$$\tan(A + B) = \frac{\left(\frac{1}{3} + \frac{1}{2}\right)}{1 - \frac{1}{3} \times \frac{1}{2}} \quad \left[\because \tan A = \frac{1}{3}, \tan B = \frac{1}{2}\right]$$

$$= \frac{\left(\frac{5}{6}\right)}{\left(\frac{5}{6}\right)} = \frac{5}{6} \times \frac{6}{5} = 1$$

$$\tan(A + B) = 1 \Rightarrow \tan(A + B) = \tan 45^\circ$$

Hence, (A + B) = 45

**Question 17.**

**Solution:**

Putting A = 30° 2 A = 60°

**Question 18.**

**Solution:**

Putting A = 30° 2 A = 60°

$$\cos A = \sqrt{\frac{1+\cos 2A}{2}}$$

$$\cos 30^\circ = \sqrt{\frac{1+\cos 60^\circ}{2}} = \sqrt{\frac{1+\frac{1}{2}}{2}} = \sqrt{\frac{\frac{3}{2}}{2}}$$

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

Hence, $\cos 30^\circ = \frac{\sqrt{3}}{2}$

$$\tan 60^\circ = \frac{2\tan 30^\circ}{1-\tan^2 30^\circ} = \frac{2 \times \frac{1}{\sqrt{3}}}{1-\left(\frac{1}{\sqrt{3}}\right)^2} = \frac{2 \times \frac{1}{\sqrt{3}}}{1-\frac{1}{3}}$$

$$= \frac{2}{\sqrt{3}} \times \frac{3}{2} = \sqrt{3}$$

Hence, $\tan 60^\circ = \sqrt{3}$

**Question 19.**

**Solution:**

Putting A = 30° 2 A = 60°

$$\sin 30^\circ = \sqrt{\frac{1-\cos 60^\circ}{2}}$$

Squaring both sides, we get

$$\sin^2 30^\circ = \frac{1-\cos 60^\circ}{2} = \frac{1-\frac{1}{2}}{2} = \frac{1}{4}$$

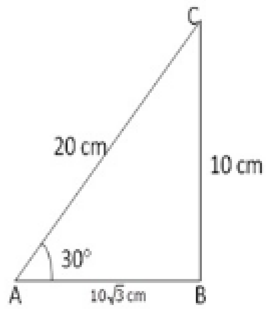
$$\sin 30^\circ = \sqrt{\frac{1}{4}}$$

$$\sin 30^\circ = \frac{1}{2}$$

**Question 20.**

**Solution:**

From right angled ∆ABC,




We have $\frac{BC}{AC} = \sin 30°$

$\Rightarrow \quad \frac{BC}{20} \Rightarrow \frac{1}{2}$, $BC = 10$ cm

By Pythagoras theorem,

$(AB)^2 = (AC)^2 - (BC)^2$

$\Rightarrow AB = \sqrt{(AC)^2 - (BC)^2}$

$\Rightarrow AB = \sqrt{(20)^2 - (10)^2}$

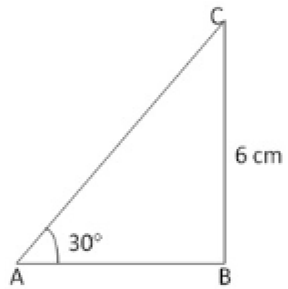
$\Rightarrow AB = \sqrt{300} = 10\sqrt{3}$ cm

Hence, $BC = 10$ cm and $AB = 10\sqrt{3}$ cm

**Question 21.**

**Solution:**

From right angled $\Delta ABC$,




We have $\frac{BC}{AC} = \sin 30°$

$\Rightarrow \frac{6}{AC} = \frac{1}{2}$

$\Rightarrow AC = 12 cm$

By Pythagoras theorem,

$(AB)^2 = (AC)^2 - (BC)^2$

$\Rightarrow AB = \sqrt{(AC)^2 - (BC)^2}$

$\Rightarrow AB = \sqrt{(12)^2 - (6)^2}$

$\Rightarrow AB = \sqrt{144 - 36}$

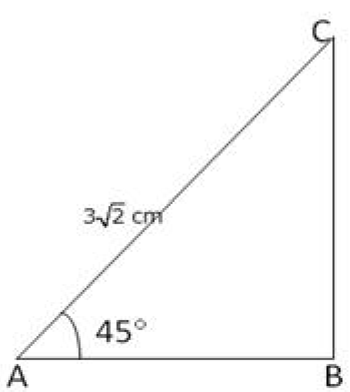
$\Rightarrow AB = \sqrt{108} = 6\sqrt{3} cm$

Hence, $AB = 6\sqrt{3}$ cm and $AC = 12$ cm

**Question 22.**

**Solution:**

From right angled $\Delta ABC$,



(i)

$$\frac{BC}{AC} = \sin 45°$$

$$\Rightarrow \quad \frac{BC}{3\sqrt{2}} = \frac{1}{\sqrt{2}}$$

$$\Rightarrow \quad BC = 3$$

(ii)

By Pythagoras theorem

$$(AB)^2 = \sqrt{(AC)^2 - (BC)^2} = \sqrt{(3\sqrt{2})^2 - (3)^2}$$

$$\Rightarrow \quad \sqrt{18-9} = \sqrt{9} = 3\,cm$$

Hence, (i) BC = 3cm and (ii) AB = 3cm.

**Question 23.**

**Solution:**

sin (A + B)= 1  sin (A + B) = sin90°

$$[\because \sin 90° = 1]$$

$$\Rightarrow \quad A + B = 90° \quad ----(1)$$

$$\cos(A - B) = 1 \Rightarrow \cos(A - B) = \cos 0°$$

$$\Rightarrow \quad A - B = 0° \quad ----(2)$$

Adding (1) and (2), we get

2A = 90° ⇒ A = 45°

Putting A = 45° in (1) we get

45° + B = 90° ⇒ B = 45°

Hence, A = 45° and B = 45°.

**Question 24.**

**Solution:**

$$\sin(A-B)=\frac{1}{2}\Rightarrow \sin(A-B)=\sin 30^\circ$$

$$\Rightarrow \quad A-B=30^\circ \quad -----(1)$$

$$\cos(A+B)=\frac{1}{2}\Rightarrow \cos(A+B)=\cos 60^\circ$$

$$\Rightarrow \quad A+B=60^\circ \quad -----(2)$$

Solving (1) and (2), we get

2A = 90° ⇒ A = 45°

Putting A = 45° in (1), we get

45° – B = 30° ⇒ B = 45 – 30° = 15°

Hence, A = 45°, B = 15°.

**Question 25.**

**Solution:**

$$\tan(A-B)=\frac{1}{\sqrt{3}}\Rightarrow \tan(A-B)=\tan 30^\circ$$

$$\Rightarrow \quad A-B=30^\circ \;-----(1)$$

$$\tan(A+B)=\sqrt{3}\Rightarrow \tan(A+B)=\tan 60^\circ$$

$$\Rightarrow \quad A+B=60^\circ \;-----(2)\left[\tan 60^\circ=\sqrt{3}\right]$$

Solving (1) and (2), we get

2A = 90° ⇒ A = 45°

Putting A = 45° in (1), we get

45° – B = 30° ⇒ B = 45° – 30° = 15°

A = 45°, B = 15°

**Question 26.**

**Solution:**

We know that

$\mathrm{cosec}^2\theta - \cot^2\theta = 1$

$\Rightarrow (3x)^2 - \left(\frac{3}{x}\right)^2 = 1$

$\Rightarrow 9x^2 - \frac{9}{x^2} = 1$

$\Rightarrow 9\left(x^2 - \frac{1}{x^2}\right) = 1$

$\Rightarrow 3 \times 3\left(x^2 - \frac{1}{x^2}\right) = 1$

$\Rightarrow 3\left(x^2 - \frac{1}{x^2}\right) = \frac{1}{3}$

**Question 27.**

**Solution:**

(i) $\sin(A+B) = \sin A\cos B + \cos A\sin B$

Taking $A = 45°$ and $B = 30°$, we have

$\sin(45° + 30°) = \sin 45°\cos 30° + \cos 45°\sin 30°$

$$\therefore \sin 75° = \frac{1}{\sqrt{2}} \times \frac{\sqrt{3}}{2} + \frac{1}{\sqrt{2}} \times \frac{1}{2}$$

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

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

(ii) $\cos(A-B) = \cos A\cos B + \sin A\sin B$

Taking $A = 45°$ and $B = 30°$, we have

$\cos(45° - 30°) = \cos 45°\cos 30° + \sin 45°\sin 30°$

$$\therefore \cos 15° = \frac{1}{\sqrt{2}} \times \frac{\sqrt{3}}{2} + \frac{1}{\sqrt{2}} \times \frac{1}{2}$$

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

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

# RS Aggarwal Class 10 Solutions

# About RS Aggarwal Class 10 Book

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He was born on January 2, 1946 in a village of Delhi. He graduated from Kirori Mal College, University of Delhi. After completing his M.Sc. in Mathematics in 1969, he joined N.A.S. College, Meerut, as a lecturer. In 1976, he was awarded a fellowship for 3 years and joined the University of Delhi for his Ph.D. Thereafter, he was promoted as a reader in N.A.S. College, Meerut. In 1999, he joined M.M.H. College, Ghaziabad, as a reader and took voluntary retirement in 2003. He has authored more than 75 titles ranging from Nursery to M. Sc. He has also written books for competitive examinations right from the clerical grade to the I.A.S. level.

# Frequently Asked Questions (FAQs)

### Why must I refer to the RS Aggarwal textbook?

RS Aggarwal is one of the most important reference books for high school grades and is recommended to every high school student. The book covers every single topic in detail. It goes in-depth and covers every single aspect of all the mathematics topics and covers both theory and problem-solving. The book is true of great help for every high school student. Solving a majority of the questions from the book can help a lot in understanding topics in detail and in a manner that is very simple to understand. Hence, as a high school student, you must definitely dwell your hands on RS Aggarwal!

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