# MATHEMATICS

| Class – 9th | Topic – Trigonometry |
|---|---|

1. If $\sin\theta = \frac{3}{5}$ and $\theta$ is an acute angle, find the values of $\cos\theta$ and $\tan\theta$. $\left[\frac{4}{5}, \frac{3}{4}\right]$

2. If $\sin\theta = \frac{\sqrt{3}}{2}$, find the value of $(\csc\theta + \cot\theta)$. $[\sqrt{3}]$

3. If $\cot\theta = \frac{1}{\sqrt{3}}$, show that $\left[\frac{1-\cos^2\theta}{2-\sin^2\theta}\right] = \frac{3}{5}$.

4. If $\sec\theta = \frac{13}{5}$, show that $\left(\frac{2\sin\theta - 3\cos\theta}{4\sin\theta - 9\cos\theta}\right) = 3$.

5. If $\cot\theta = \frac{q}{p}$, show that $\left(\frac{p\sin\theta - q\cos\theta}{p\sin\theta + q\cos\theta}\right) = \left(\frac{p^2 - q^2}{p^2 + q^2}\right)$.
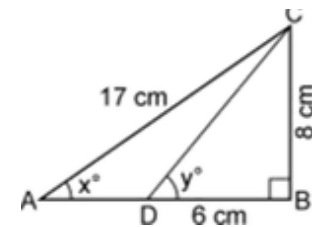
6. If $\cos A = \frac{1}{2}$ and $\sin B = \frac{1}{\sqrt{2}}$, find the value of: $\frac{\tan A - \tan B}{1 + \tan A \tan B}$. $[2 - \sqrt{3}]$

7. Use the adjoining figure and write the value of:
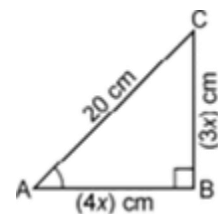
   a) $\sin x°$ $\left[\frac{8}{17}\right]$

   b) $\cos y°$ $\left[\frac{6}{10}\right]$

   c) $3\tan x° - 2\sin y° + 4\cos y°$ $\left[\frac{12}{5}\right]$



8. If $(\tan\theta + \cot\theta) = 5$, find the value of $(\tan^2\theta + \cot^2\theta)$. $[23]$

9. In the given figure, $\Delta ABC$ is right angled at B. if $AC = 20$cm and $\tan A = \frac{3}{4}$, find the length of AB and BC. $[16cm, 12\ cm]$
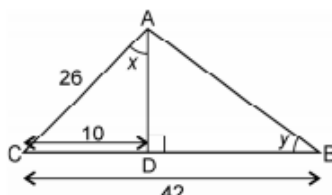


10. If $\sec A = \sqrt{2}$, find the value of $\frac{3\cos^2 A + 5\tan^2 A}{4\tan^2 A - \sin^2 A}$. $\left[\frac{13}{7}\right]$

11. In the following figure, $AD \perp BC$, $AC = 26$, $CD = 10$, $BC = 42$, $\angle DAC = x$, $\angle B = y$, find the value of:
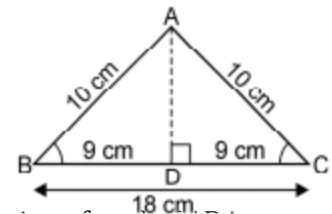
   (i) $\cot x$ $[2.4]$

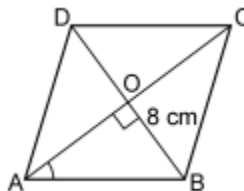   (ii) $\frac{1}{\sin^2 y} - \frac{1}{\tan^2 y}$ $[1]$

12. In an isosceles triangle ABC; AB = AC = 10 cm and BC = 18 cm. Find the value of :
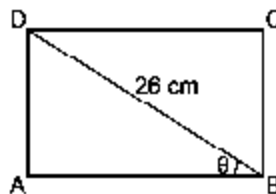
    (i)  $\sin^2 B + \cos^2 C$          [1]

    (ii) $\tan^2 C - \sec^2 B + 2$        [1]



13. In rhombus ABCD, diagonals AC and BD intersect each other at point O. If cosine of angle OAB is 0.6 and OB = 8 cm, find the length of the side and the diagonals of the rhombus.   [10 cm, 16 cm]



14. In rectangle ABCD, diagonal BD = 26 cm and cotangent of angle ABD = 1.5. Find the area and the perimeter of the rectangle ABCD.        [312 cm², $20\sqrt{13}$ cm]



15. If $2 \sin x = \sqrt{3}$, evaluate:

    (i)  $4 \sin^3 x - 3 \sin x$                              [0]

    (ii) $3 \cos x - 4 \cos^3 x$                            [1]