VIDYA BHAWAN BALIKA VIDYAPITH

SHAKTI UTTHAN ASHRAM, LAKHISARAI

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5. tan x = -5/12, x lies in second quadrant.

Solution:

It is given that

tan x = – 5/12

We can write it as

$$\cot x = \frac{1}{\tan x} = \frac{1}{\left(-\frac{5}{12}\right)} = -\frac{12}{5}$$

We know that

$1 + \tan^2 x = \sec^2 x$

We can write it as

$1 + (-5/12)^2 = \sec^2 x$

Substituting the values

$1 + 25/144 = \sec^2 x$

$\sec^2 x = 169/144$

$\sec x = \pm 13/12$

Here x lies in the second quadrant so the value of sec x will be negative

sec x = – 13/12

We can write it as

$$\cos x = \frac{1}{\sec x} = \frac{1}{\left(-\frac{13}{12}\right)} = -\frac{12}{13}$$

So we get

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

$$-\frac{5}{12} = \frac{\sin x}{\left(-\frac{12}{13}\right)}$$

By further calculation

$$\sin x = \left(-\frac{5}{12}\right) \times \left(-\frac{12}{13}\right) = \frac{5}{13}$$

Here

$$\text{cosec}\, x = \frac{1}{\sin x} = \frac{1}{\left(\frac{5}{13}\right)} = \frac{13}{5}$$

Find the values of the trigonometric functions in Exercises 6 to 10.

6. sin 765°

Solution:

We know that values of sin x repeat after an interval of 2π or 360°

So we get

$$\sin 765° = \sin\left(2 \times 360° + 45°\right)$$

By further calculation

= sin 45◦

= 1/ √ 2

7. cosec (–1410°)

Solution:

We know that values of cosec x repeat after an interval of 2π or 360°

So we get

$$\text{cosec}\ \left(-1410°\right) = \text{cosec}\left(-1410° + 4 \times 360°\right)$$

By further calculation

$$= \text{cosec}\ \left(-1410° + 1440°\right)$$

= cosec 30◦ = 2