WORKSHOP CALCULATION AND SCIENCE-UNIT 10: TRIGONOMETRY

SEMESTER – II

Trigonometry Table

	0°	30°	45°	60°	90°
sin θ	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1
cos θ	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0
tan θ	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	Not defined
cosec θ	Not defined	2	$\sqrt{2}$	$\frac{2}{\sqrt{3}}$	1
sec θ	1	$\frac{2}{\sqrt{3}}$	$\sqrt{2}$	2	Not defined
cot θ	Not defined	$\sqrt{3}$	1	$\frac{1}{\sqrt{3}}$	0

1. How many degrees is equal to one radian? *
   a) π/360 b) 360/π c) π/180 d) 180/π
   Ans: 180/π

2. Which is equal to sinθ? *
   a) opp side/ hypotenuse
   b) hypotenuse/opp side
   c) Adjacent side/hypotenuse
   d) hypotenuse/adjacent side
   Ans: opp side/ hypotenuse

3. What is equal to cosθ? *
   a) Hypotenuse/adjacent side
   b) adjacent side/hypotenuse
   c) opp side/hypotenuse
   d) hypotenuse/opp side
   Ans: adjacent side/hypotenuse

4. What is equal to tanθ? *
   a) opp side/hypotenuse
   b) adjacent side/hypotenuse
   c) opp side/adjacent side
   d) adjacent side/opp side
   Ans: opp side/adjacent side

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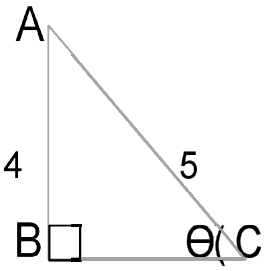
5. what is the value of tanθ if sin=4/5 *

a) 4/5 b) 5/3 c) ¾ d) 4/3



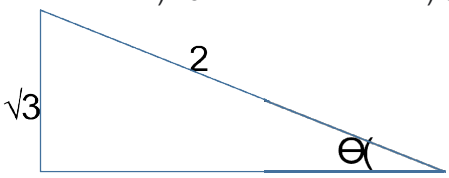
Ans:

Opposite side AB = 4; Adjacent side BC= $\sqrt{AC^2 - AB^2}$ = $\sqrt{5^2 - 4^2}$ = 3 (adjacent side)

Tan θ = $\frac{\text{opposite side}}{\text{adjacent side}} = \frac{AB}{BC} = \mathbf{\frac{4}{3}}$

6. what is the value of θ if sinθ=√3/2 *

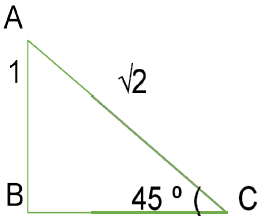
a) 30° b) 45° c) 60° d) 90°



Ans: θ = sin−1 $\sqrt{3/2}$ = **60º**

7. What is the value of tan 45° if sin 45° = 1/√2? *

a) 1/√2 b) 3/2 c) 1 d) 1/√3



Ans:

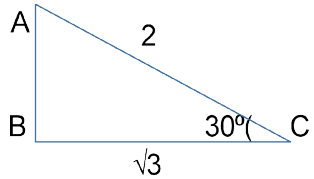
BC= $\sqrt{AC^2 - AB^2}$ = $\sqrt{\sqrt{2}^2 - 1^2}$ = $\sqrt{2 - 1}$ = 1

Sin 45° = $\frac{1}{\sqrt{2}} = \frac{AB}{AC}$; Tan 45° = $\frac{AB}{BC} = \frac{1}{1} = \mathbf{1}$

8. What is the value of sin 30° if cos 30° = √3/2 ? *

a) √3/2 b) ½ c) 1/√3 d) 1/√2

Ans:



AB= $\sqrt{AC^2 - AC^2}$ = $\sqrt{2^2 - \sqrt{3}^2}$ = $\sqrt{4 - 3}$ = 1

cos 30° = $\frac{\sqrt{3}}{2} = \frac{BC}{AC}$; Sin 30° = $\frac{AB}{AC} = \mathbf{\frac{1}{2}}$

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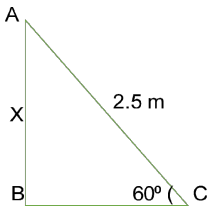
9. What is 1 + $\cot^2 q$? *

a) $\sec^2 q$ b) $\operatorname{cosec}^2 q$ c) $\cot^2 q$ d) $\tan^2 q$

Ans: $\operatorname{cosec}^2 q$

10. What is the height of the wall where the ladder touches the wall if the ladder is 2.5 m long makes an angle of 60° with the ground? *



a) 4.13m b) 4.23m c) 2.165m d)4.43m

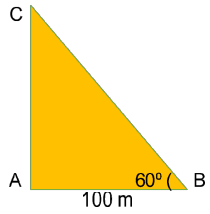
Ans: AC =Ladder; AB = Wall

$$\sin 60^\circ = \frac{opposite\ side}{Hypotenuse} = \frac{AB}{AC}$$

$$\frac{\sqrt{3}}{2} = \frac{X}{2.5}$$

X = 2.165M

11. What is the height of AC? *



a) 1.732m b) 17.32m c) 173.2m d) 1732m

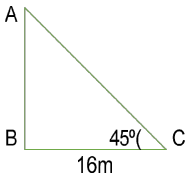
Ans: $\tan 60^\circ = \frac{opposite\ side}{adjacent\ side} = \frac{AC}{AB}$

$\sqrt{3} = \frac{AC}{100}$

AC = $\sqrt{3}$ X 100 = **173.2m**

12. What is the height of the building if a ladder at 45° touches the building placed 16 m from the base of the building? *

a) 15m b) 16m c) 17m d) 18m



Ans:

AB =Height of the Building ; BC = Base of the building ;

$\tan 45^\circ = \frac{opposite\ side}{adjacent\ side} = \frac{AB}{BC}$

$1 = \frac{Height\ of\ building}{16}$

Height of building AB = 1 x 16 = 16m

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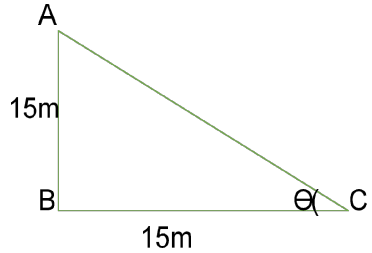
13. What is the angle of elevation of the top of a light house of 15 m height seen at a point 15 m away from the base? *

a) 30° b) 45° c) 60° d) 90°

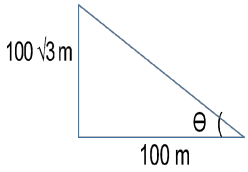


Ans: AB = Light house; A = Top of the light house ; B = Bottom of the light house;

$$\tan \Theta = \frac{opposite\ side}{adjacent\ side} = \frac{AB}{BC} = \frac{15}{15} = 1;$$

$$\Theta = \tan^{-1}(1) = 45^{o}$$

14. What is the angle of θ? *



a) 30° b) 45° c) 60° d) 90°

Ans: $\tan \Theta = \frac{opposite\ side}{adjacent\ side} = \frac{100\sqrt{3}}{100} = \sqrt{3};$

$\Theta = \tan^{-1}(\sqrt{3}) =$ **60°**

15. What is the term for the object seen higher than eye level? *

a) angle of inclination b) angle of friction c) angle of elevation d) angle of depression

Ans: **Angle of elevation**