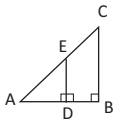
10TH CLASS MATHEMATICS IMPORTANT QUESTIONS

IMPORTANT QUESTIONS

1. Find the distance between the points A (asinθ, 0); B(0, acosθ)

A. Distance of AB $=\sqrt{a^2\sin^2\theta + a^2\cos^2\theta}$

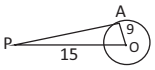
2. In the adjacent picture
AD = 3cm, AB = 8cm,
DE = 4.5 cm. Then find BC



A. $=\sqrt{a^2(1)} = a$

3. Calculate the length of tangent from a point 15 cm away from the centre of circle of radius 9cm.

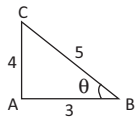
A.



$OP^2 = OA^2 + PA^2 \Rightarrow 15^2$
$= 9^2 + AP^2 = 225 - 81$
$AP = \sqrt{144} = 12cm$

4. If 3 tan A = 4 then find sinA, cosA.

A. $TanA = \frac{4}{3}$



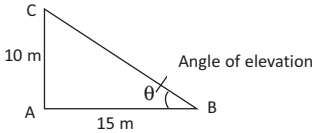
$BC = 5, SinA = \frac{4}{5}, CosA = \frac{3}{5}$

5. Express Sin75°+Cos 65° in terms of trigonometric ratios of angles between 0° and 45°.

A. sin(90–15)+Cos(90–35°) ⇒cos15°+ sin35°

6. Draw a rough diagram of the following data.
"A pole 10 m high casts a shadow 15m long on the ground". Find the sun's Elevation.

A.



7. There are five cards in a box with numbers 1 to 5. If one card is drawn at randomly what is the probability of an even number.

A. Total possible outcomes n(S) = 5
Favorable outcomes (n(E) = even numbers = 2, 4 = 2

$P(E) = \frac{N(E)}{N(S)} = \frac{2}{5}$

8. Write the formula of mean by deviation method.

A. $Mean = \bar{x} = A + \frac{\Sigma fd}{\Sigma f}$

9. Find the probability of getting 53 sundays.

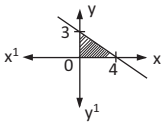
A. $\frac{2}{7}\left[\begin{matrix}\text{In a leap year 52 sundays and 2 days}\\ 53 \text{ sundays } = 2/7\end{matrix}\right]$

10. If sinθ = ½ then what is the value of sin2θ

A. Sinθ = sin30

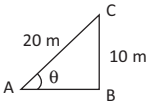
$\Rightarrow \sin2\theta = \sin60° = \frac{\sqrt{3}}{2}$

11. In the adjacent picture
Find the area of
shaded portion.



A. Area of the shaded portion = Area of right angle
= ½bh = ½ × 3× 4 = 6 sq. units.

12. In the adjacent picture
BC = 10m, Ac = 20m
then find 'θ'.



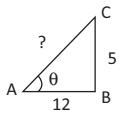
A. In the given picture

$\sin\theta = \frac{10}{20} = \left(\frac{\text{Opposite side}}{\text{Hypotenious}}\right)$

sinθ = ½ = sin30° ⇒ θ = 30°

13. A Man goes 12 m due east and then 8m due north. How far is he from the starting point.

A. By Pythagoras
$AC^2 = AB^2 + BC^2$
$= (12)^2 + (5)^2$
$= 144 + 25 = 169$
$AC = \sqrt{169} = 13m$



14. If three coins are tossed at a time then what is the probability of 3 heads.

A. No.of Possible outcomes n(s) = 8
No.of favorable outcomes n(E) = 1

$P(H) = \frac{n(E)}{n(S)} = \frac{1}{8}$

15. Find the mean of 1st 5 prime numbers

A. First 5 prime numbers 2, 3, 5, 7, 11

$Mean = \frac{\text{Sum of observations}}{\text{No.of observations}}$

$\bar{x} = \frac{2+3+5+7+11}{5} = \frac{28}{5} = 5.6$

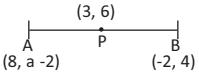
$\therefore$ Mean = 5.6

16. Find the mode of sin 90°, cos 0°, sin 0° and tan 45°.

A. We know the trigonometric ratios
sin90° =1, cos0° = 1, sin0° = 0, tan45° = 1
∴ Mode of the data = 1

17. If the midpoint of the line segment joining the points A(8, a – 2) and B(–2, 4) is (3, 6). Find the value of a.

A.



We know the mid point formula

$P(3,6) = \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

$(3,6) = \left(\frac{8-2}{2}, \frac{a-2+4}{2}\right)$

Compare the points

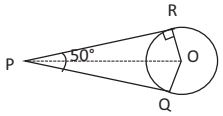
$\frac{a+2}{2} = 6 \Rightarrow a+2 = 12$

a = 10

18. If sin(A – B) = ½ cos(A + B) = ½, 0 < A + B ≤ 90°, then find A & B.

A. Sin(A – B) = Sin 30°
⇒ A – B = 30° ——(1)
Cos (A + B) = cos60°
A + B = 60° ——(2)
From (1) & (2) we will get
A – B = 30
A + B = 60
2A = 90
A = 45°, B = 15°

19. In the below picture, if ∠RPO = 50°
then find ∠ROP



A. Given that ∠RPO = 50°
We know that ∠PRO= 90°

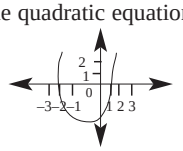
(∵ Radius ⊥ point of contact)
Sum of interior angles of a triangle is 180°
∠RPQ + ∠PRO + ∠POR = 180°
50 + 90 + ∠POR = 180°
∠POR = 180–140° = 40°
∴∠POR = 40°

MULTIPLE CHOICE QUESTIONS

1. If one root of the equation $4x^2-2x+(\lambda-4)=0$ be the reciprocal of the other,thenλ= ( )
1) 8 2) 7 3) 6 4) 5

2. The sum of a number and its reciprocal is 5/2 Represent this situation as ( )
1) $x^2+x=\frac{5}{2}$ 2) $x+\frac{1}{x}=\frac{5}{2}$
3) $x-\frac{1}{x}=\frac{5}{2}$ 4) None

3. From the figure the roots of the quadratic equation are ( )



1) –2, 1 2) –1, 2 3) 0, 1 4) 0, 2

4. The roots of the quadratic equation $\frac{x^2-8}{x^2+20}=\frac{1}{2}$ are ( )
1) ±2 2) ±3 3) ±4 4) ±6

5. If a, b, c are in A.P., then ( )
1) 2b = a+c 2) b=a+c
3) b = ac 4) $b=\sqrt{ac}$

6. If the sum of first k terms of an A.P. is $3k^2-k$ and its common difference is 6 then the first term is ( )
1) 1 2) 2 3) 3 4) 4

7. Find the sum of first 15 multiples of 8( )
1) 960 2) 1000 3) 940 4) 1060

8. In a G.P. 3rd term is 24 and 6th term is 192, then 10th term is ( )
1) 1024 2) 2048 3) 3072 4) 4024

9. In a garden there are 32 rose flowers in first row and 29 flowers in 2nd row, 26 flowers in 3rd row, then how many rose flowers are there in the 6th row ( )
1) 14 2) 15 3) 16 4) 17

10. The common difference of an Arithmetic progression, whose 3rd term is 5 and 7th term is 9, is ( )
1) 1 2) 2 3) 3 4) 4

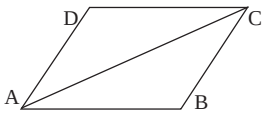
11. The distance between (x_1,y_1) and (x_2, y_2) is ( )
1) $\sqrt{(x_2+x_1)^2+(y_2+y_1)^2}$ 2) $\sqrt{(x_2-x_1)^2+(y_2+y_1)^2}$
3) $\sqrt{(x_2+x_1)^2+(y_2-y_1)^2}$ 4) $\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

12. The triangle with vertices (–2, 1), (2,–2) and (5, 2) is ( )
1) Scalene 2) Equilateral
3) Isosceles 4) Right angled isosceles

13. The co-ordinates of the centroid of the triangle whose vertices are (8,–5), (–4,7) and (11, 13) are ( )
1) (2,2) 2) (3,3) 3) (4,4) 4) (5,5)

14. 'Heron's formula to find the area of a triangle is ( )
1) $\sqrt{(s-a)(s-b)(s-c)}$ 2) $\sqrt{s(s+a)(s+b)(s+c)}$
3) $\sqrt{s(s-a)(s-b)(s-c)}$
4) None

15. From the figure, if area of ΔABC=5sq. units, then the area of given parallelogram is ____ sq.units ( )
1) 5 2) 10 3) 2.5 4) 15



6. If a straight line passing through the points P (x_1,y_1), Q(x_2, y_2) is making an angle 'θ' with positive X-axis, then the slope of the straight line is ( )
1) $\frac{y_2+y_1}{x_2+x_1}$ 2) θ
3) $\frac{y_2-y_1}{x_2-x_1}$ 4) sin θ

17. In triangles ABC and DEF, ∠A = ∠E = 40º, AB:ED = AC:EF and ∠F = 65º, then ∠B = ( )
1) 35º 2) 65º
3) 75º 4) 85º

18. Sides of two similar triang les are in the ratio 4:9. Areas of these triangles are in the ratio ( )
1) 2:3 2) 4:9 3) 81:16 4) 16:81

19. In an equilateral triangle ABC, if AD⊥BC, then ( )
1) $2AB^2 = 3AD^2$
2) $4AB^2 = 3AD^2$
3) $3AB^2 = 4AD^2$
4) $3AB^2 = 2AD^2$

20. If ΔABC is an isoscles triangle and D is a point on BC such that AD ⊥BC, then ( )
1) $AB^2- AD^2 = BD.DC$
2) $AB^2–AD^2=BD^2–DC^2$
3) $AB^2+AD^2=BD.DC$
4) $AB^2+AD^2=BD^2–DC^2$

ANSWERS

1) 1	2) 2	3) 1	4) 4	5) 1
6) 2	7) 1	8) 3	9) 4	10) 1
11) 4	12) 4	13) 4	14) 3	15) 2
16) 3	17) 3	18) 4	19) 3	20) 1