Maths Questions for CLAT Exam.

CLAT Maths Quiz 6

Directions: Kindly study the following Questions carefully and choose the right answer:

1. A regular hexagon is inscribed in a circle of radius 5 cm. If x is the area inside the circle but outside the regular hexagon, then which one of the following is correct?

A. 13 cm2 < x < 15 cm^2

B. 15 cm2 < x < 17 cm^2

C. 17 cm2 < x < 19 cm^2

D. 19 cm2 < x < 21 cm^2

2. Find the length of canvas 1.25 m wide required to build a conical camp of base radius 7 metres and height 24 metres.

A. 120 m

B. 250 m

C. 440 m

D. 630 m

3. The angle of elevation of the top of an unfinished pillar at a point 150 m from its base is 30°. If the angle of elevation at the same point is to be 45°, then the pillar has to be raised to a height of how many metres?

A. 59.4 m

B. 61.4 m

C. 62.4 m

D. 63.4 m

4. Consider the following statements
I. x + 3 is the factor of x3 + 2x2 + 3x + 8.
II. x – 2 is the factor of x3 + 2x2 + 3x + 8.
Which of the statements given above is/are correct?

A. Only I

B. Only II

C. Both I and II

D. Neither I nor II

5. In a fraction's numerator is increased by 1 and the denominator is increased by 2 then the fraction becomes 2/3. But when the numerator is increased by 5 and the denominator is increased by 1 then the fraction becomes 5/4. What is the value of the original fraction?

A. 3/7

B. 5/8

C. 5/7

D. 6/7

6. What is the least number which, when divided by 52, leaves 33 as the remainder, and when divided by 78 leaves 59, and when divided by 117 leaves 98 as the respective remainders.

A. 449 B. 444

C. 348 D. 541

7. Gold is 19 times as heavy as water and copper 9 times as heavy as water. The ratio in which these two metals be mixed so that the mixture is 15 times as heavy as water, is

A. 1 : 2 B. 2 : 3

C. 3 : 2 D. 19 : 135

8. In a class of 60 children, 30% children can speak only English, 20% Hindi and English both and the rest of the children can speak only Hindi. How many children can speak Hindi?

A. 42 B. 36

C. 30 D. 48

9. If the ages of P and R are added to twice the age of Q, the total becomes 59. If the ages of Q and R are added to thrice the age of P, the total becomes 68. And if the age of P is added to thrice the age of Q and thrice the age of R, the total becomes 108. What is the age of P?

A. 15 yrs B. 19yrs

C. 17 yrs D. 12 yrs

10. A shopkeeper gave an additional 20 percent concession on the reduced price after giving 30 percent standard concession on an article. If Arun bought that article for Rs. 1120, what was the original price?

A. Rs. 3000 B. Rs. 4000

C. Rs. 2400 D. Rs. 2000

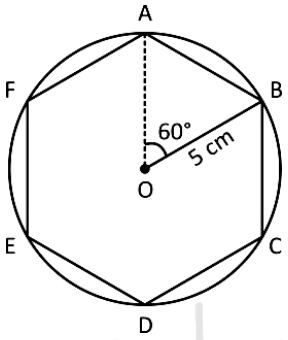
Correct Answers:

1	2	3	4	5	6	7	8	9	10
A	C	C	D	C	A	B	A	D	D

Explanations:

1. OB = OA = radius

Also, $\angle AOB = 60°(\frac{360°}{6} = 60°)$



and $\angle OAB = \angle OBA = 60°$ So, ΔAOB is an equilateral triangle. Then, AB = 5 cm

So, Area, x = Area of circle – Area of hexagon

$= \pi r^2 - \frac{3\sqrt{3}\,(a)^2}{2}$

$= \frac{22}{7} \times (5)^2 - \frac{3\sqrt{3}}{2} \times (5)^2$ ($\because$ r = a = 5)

$= 78.57 - 64.95 = 13.62\ cm^2$

Hence, option A is correct.

2. Here, r = 7m and h = 24m.

So, $I = \sqrt{\mathbf{r^2 + h^2}} \Rightarrow \sqrt{\mathbf{7^2 + (24)^2}} \Rightarrow \sqrt{\mathbf{625}} \Rightarrow \mathbf{25m}$

Area of canvas = πrl

$\Rightarrow (\frac{22}{7} \times 7 \times 25)m^2 \Rightarrow 550m^2$

$\therefore$ Length of canvas = $(\frac{\text{Area}}{\text{Width}}) = (\frac{550}{1.25})m$

$\Rightarrow$ 440 m.

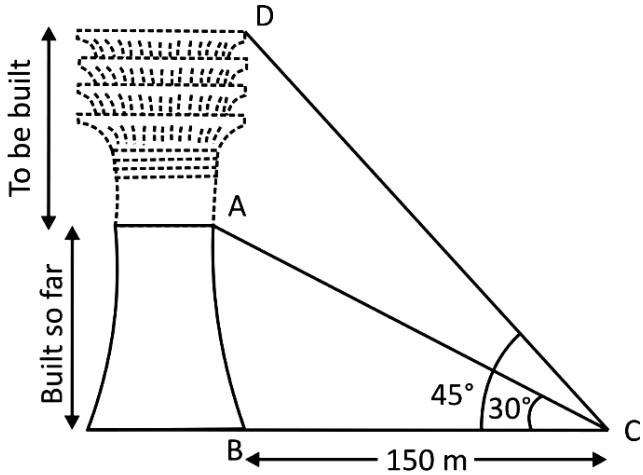
Hence, option C is correct

3. Given, $BC = 150$ m

$\angle ACB = 30°$

And, $\angle DCB = 45°$

Then, $AD = ?$



In ΔABC, $\tan 30° = \frac{AB}{BC}$

$$\frac{1}{\sqrt{3}} = \frac{AB}{150}$$

$\therefore$ $$AB = \frac{150}{\sqrt{3}} = 86.6 \text{ m}$$

In ΔDBC, $\tan 45° = \frac{DB}{BC}$

$$1 = \frac{DB}{150}$$

$$DB = 150$$

$$AD + AB = 150 \quad [\because DB = AD + AB]$$

$\therefore$ $$AD = 150 - AB$$

$$= 150 - 86.6 = 63.4 \text{ m}$$

Hence, option C is correct.

4. Put $x = -3$ in equation $x^3 + 2x^2 + 3x + 8 = (-3)^3 + 2(-3)^2 + 3(-3) + 8 = -10 \neq 0$

So, $(x + 3)$ is not the factor of $x^3 + 2x^2 + 3x + 8$

Similarly, put $x = 2$ in above equation

$= (2)^3 + 2(2)^2 + 3(2) + 8 = 30 \neq 0$

So, $(x - 2)$ is also not the factor of $x^3 + 2x^2 + 3x + 8$.

Hence, option D is correct.

5. Let the fraction be $\frac{x}{y}$ then,

$\frac{x + 1}{y + 2} = \frac{2}{3}$ or, $3x + 3 = 2y + 4$

or, $3x = 2y + 1$.....(i)

Also, we have $\frac{x+5}{y+1} = \frac{5}{4}$

or, $4x + 20 = 5y + 5$ or, $4x = 5y - 15$ .....(ii)

From (i) and (ii), we get

$\frac{2y+1}{3} = \frac{5y-15}{4}$ or, $8y + 4 = 15y - 45$

or, $7y = 49 \therefore y = 7$ and $x = \frac{2y+1}{3} = \frac{2 \times 7 + 1}{3} = 5$

$\therefore$ Reqd. original fraction $= \frac{x}{y} = \frac{5}{7}$

Hence, option C is correct.

6. Since $(52 - 33) = 19$, $(78 - 59) = 19$, $(117 - 98) = 19$

We see that the remainder in each case is less than the divisor by 19. Hence, if 19 is added to the required number, it becomes exactly divisible by 52, 78 and 117. Therefore, the required number is 19 less than the LCM of 52, 78 and 117.

The LCM of 52, 78 and 117 = 468.

$\therefore$ The required number = 468 – 19 = 449

Hence, option A is correct.

7. Let x gm of water be taken

Then, gold = 19x gm and copper = 9x gm

Let 1 gm of gold be mixed with y gm of copper.

Then, $19x + 9xy = 15x(1 + y) \Rightarrow y = 2 : 3$

Hence, option B is correct.

8. Number of students who speak only English = 30% of 60 = 18

Number of students who speak Hindi and English = 20% of 60 = 12

∴ Number of students who speak only Hindi = 60 – 30 = 30

∴ Number of students who speak Hindi = 30 + 12 = 42

Hence, option A is correct.

9. P + R + 2Q = 59; Q + R + 3P = 68

and P + 3 (Q + R) = 108

Solving the above two equations, we get P = 12 yrs.

Hence, option D is correct.

10. Original price = $1120 \times \frac{100}{70} \times \frac{110}{80}$ = Rs. 2000

Hence, option D is correct.