

SUMMATIVE ASSESSMENT – II, 2014 [JS-20146]

MATHEMATICS /Class – X

Time allowed : 3 hours

Maximum Marks : 90

SECTION-A

Question Numbers 1 to 8 carry 1 mark each

1. If α, β are the roots of the quadratic equation $x^2 + x + 1 = 0$, then $1/\alpha + 1/\beta$

- (a) 0 (b) 1 (c) -1 (d) none of these

2. 10 defective pens are accidentally mixed with 90 good ones. It is not possible to just look at a pen and tell whether or not it is defective. One pen is taken out at random from this lot. Determine the probability that the pen taken out is a good one.

- A. 0.10 B. 0.20 C. 0.90 D. 1.0

3. If the length of a shadow cast by a pole is 3 times the length of the pole, then the angle of elevation of the sun is

- (a) 45° (b) 30° (c) 60° (d) 90°

4. The mid-point of the line segment joining P(-2,8) and Q(-6,-4) is

- (a) (-4,2) (b) (4,2) (c) (4,-2) (d) (-4,-2)

5. If a, a - 2 and 3a are in AP, then the value of a is

- (a) -3 (b) -2 (c) 3 (d) 2

6. A straight line is drawn joining the points (3, 4) and (5,6). If the line is extended, the ordinate of the point on the line, whose abscissa is -1 is

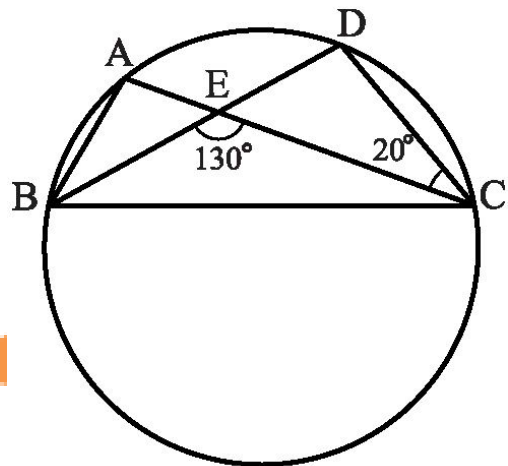
- (a) 1 (b) -1 (c) 2 (d) 0

7. If base radius and height of a cylinder are increased by 100% then its volume increased by:

- (a) 30% (b) 40% (c) 42% (d) 33.1%

8. In the given Fig., A, B, C and D are four points on a circle. AC and BD intersect at a point E such that $\angle BEC = 130^\circ$ and $\angle ECD = 20^\circ$. Find $\angle BAC$.

- (a) 110 (b) 150° (c) 90° (d) 100°



SECTION-B

Question Numbers 9 to 14 carry 2 marks each

9. Solve the equation: $2x^2 + 3x - 90 = 0$

10. Two cones with same base radius 8 cm and height 15 cm are joined together along their bases. Find the surface area of the shape so formed.

OR,

A solid metallic hemisphere of radius 8 cm is melted and recasted into a right circular cone of base radius 6 cm. Determine the height of the cone.

11. Which term of the AP 3, 8, 13, 18, will be 55 more than its 20th term?

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12. ABC is an isosceles triangle in which $AB = AC$, circumscribed about a circle. Show that BC is bisected at the point of contact.

13. The radii of two circles are 8 cm and 6 cm respectively. Find the radius of the circle having area equal to the sum of the areas of the two circles.

14. Find the ratio in which the point (11, 15) divides the line segment joining the point (15, 5) and (9, 20).

SECTION-C

Question Numbers 15 to 24 carry 3 marks each

15. Find the value of k for which the quadratic equation $(k - 12)x^2 + 2(k - 12)x + 2 = 0$ has two real equal roots.

16. Solve the equation:

$$\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}, [x \neq 0, -(a+b)]$$

17. The sum of n terms of an AP is $(5n^2 - 3n)$. Find the AP and hence find its 10th term.

18. A letter is chosen at random from the letters of the word 'ASSASSINATION'.

Find the probability that the letter chosen is a (i) vowel (ii) A (iii) S

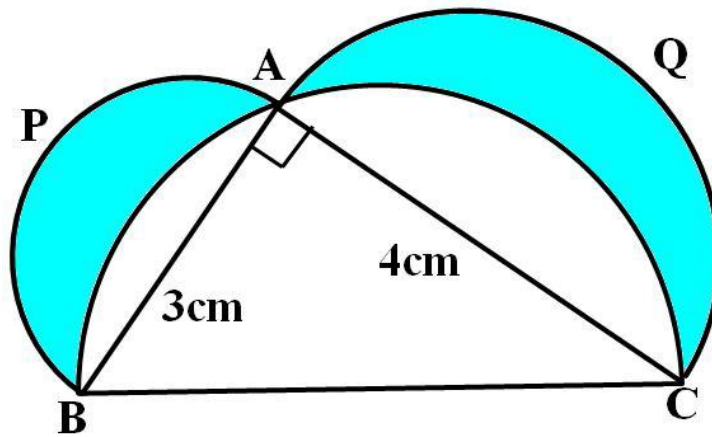
19. Prove that the parallelogram circumscribing a circle is a rhombus.

20. Draw a triangle ABC with side BC = 6 cm, AB = 5 cm and $\angle ABC = 60^\circ$. Then construct a triangle whose sides are $\frac{3}{4}$ of the corresponding sides of the triangle ABC.

21. If 10th times the 10th term of an AP is equal to 15 times the 15th term, show that its 25th term is 0.

22. Find the ratio in which the line $3x + 4y - 9 = 0$ divides the line segment joining the points A(1, 3) and B(2, 7).

23. In the given figure, $\triangle ABC$ is right angled at A. Semicircles are drawn on AB, AC and BC as diameters. It is given that AB = 3cm and AC = 4cm. Find the area of the shaded region.



24. Find the height of a mountain if the elevation of its top at an unknown distance from the base is 60° and at a distance 10 km further off from the mountain, along the same line, the angle of elevation is 30° .

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SECTION-D

CBSE

Question Numbers 25 to 34 carry 3 marks each

25. In a school, students thought of planting trees in an around the school to reduce air pollution. It was decided that the number of trees, that each section of each class will plant, will be the same as the class, in which they are studying e.g. a section of class-I will plant 1 tree, a section of class II will plant 2 trees and so on till class XII. There are three sections of each class.

How many trees will be planted by the students? What value can you infer from the planting the trees?

26. The angle of the elevation and depression of the top and bottom of a light house from top of a 60m high building are 30° and 60° respectively. Find

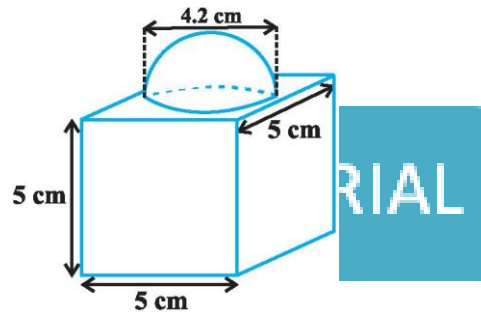
- (a) Difference between height of light house and building
- (b) Distance between height of light house and building

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27. One-fourth of a herd of camels was seen in the forest. Twice the square root of the herd had gone to mountains and the remaining 15 camels were seen on the bank of a river. Find the total number of camels.

28. The decorative block shown in Fig. is made of two solids - a cube and a hemisphere. The base of the block is a cube with edge 5 cm, and the hemisphere fixed on the top has a diameter of 4.2 cm. Find the total surface area of the block. (Take $\pi = 22/7$).



29. A right triangle, whose sides are 3 cm and 4 cm (other than hypotenuse) is made to revolve about its hypotenuse. Find the volume and surface area of the double cone so formed.

30. Five cards—the ten, jack, queen, king and ace of diamonds, are removed from the well-shuffled 52 playing cards. One card is then picked up at random. Find the probability of getting

- (a) neither a heart nor a king (b) neither an ace nor a king

31. Find the coordinates of the circum centre of a triangle whose vertices are A(8, 6), B(8, -2) and C(2, -2). Also, find its circum radius..

32. A circle is drawn with diameter AB intersecting the hypotenuse AC of right triangle ABC at the point P. Show that the tangent to the circle at P bisects the side BC.

33. Three numbers are in the ratio 3:7:9. If 5 is subtracted from the second, the resulting numbers are in AP. Find the original numbers.

34. Triangle ABC is drawn to circumscribe a circle of radius 4 cm such that the segments BD and DC into which BC is divided by the point of contact D are of lengths 8 cm and 6 cm respectively as shown in below left figure. Find the sides AB and AC

