

# Ashwani Gupta



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## Class - X

## Mathematics

### GENERAL INSTRUCTIONS:

1. All questions are compulsory.
2. The question paper consists of thirty four questions divided into four sections A, B, C & D. Section A comprises of ten questions of 01 marks each, Section B comprises of eight questions of 02 marks each, Section C comprises of ten questions of 03 marks each and section D comprises of six questions of 04 marks each.
3. All questions in section A are multiple choice questions where you are to select one correct option out of given four.
4. There is no overall choice. However internal choice has been provided in one question of 02 marks each, three questions of 03 marks each and two questions of 04 mark each. You have to attempt only one of the alternatives in all such questions.
5. Use of calculators is not permitted.

### Section - 'A'

1. If the two roots are 3 and  $-3$  of a quadratic equation, then the quadratic equation is formed in:  
(a)  $x^2 + 9 = 0$  (b)  $x^2 - 9 = 0$   
(c)  $x^2 + 3x - 3 = 0$  (d)  $x^2 - 3x + 3$
2. The condition for the quadratic equation  $ax^2 + bx + c$  to have real roots is:  
(a)  $b^2 - 4ac < 0$  (b)  $b^2 - 4ac > 0$   
(c)  $b^2 - 4ac \geq 0$  (d)  $b^2 - 4ac \leq 0$
3. If the radius of the circle is  $3cm$ , then the distance between the two parallel tangents is:  
(a)  $6cm$  (b)  $6.5cm$   
(c)  $5.5cm$  (d)  $8cm$
4. How many tangents can be drawn to a circle at a given point on its circumference?  
(a) 1 (d) 5  
(c) 10 (d) infinite
5. From an external point T, tangent PT drawn to circle whose centre O. If  $OT = 29cm$  &  $PT = 21cm$ , determine the radius of the circle:  
(a)  $20cm$  (b)  $15cm$   
(c)  $30cm$  (d)  $12cm$
6. PA & PB are two tangents to the circle with centre O, then AOBP is:  
(a) a trapezium (b) rectangle  
(c) cyclic quadrilateral (d) rhombus
7. A drinking glass is in the shape of a frustum of a cone of height  $14cm$ . The diameter of its two circular ends are  $4cm$  and  $2cm$ , then the capacity of the glass is:  
(a)  $102.67cm^3$  (b)  $103.67cm^3$   
(c)  $110.5cm^3$  (d)  $112.67cm^3$

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8. The perimeter of a semicircle having a radius of  $14\text{cm}$  is:
- (a)  $74\text{cm}$  (b)  $72\text{cm}$   
(c)  $64\text{cm}$  (d)  $70\text{cm}$
9. The string of a kite is  $150\text{m}$  long & it makes an angle of  $60^\circ$  with the horizontal. The height of the kite above the ground is:
- (a)  $130\text{m}$  (b)  $129.9\text{m}$   
(c)  $130.9\text{m}$  (d)  $132\text{cm}$
10. The probability of getting 53 fridays in a non-leap year is:
- (a)  $\frac{1}{7}$  (b)  $\frac{2}{7}$   
(c)  $\frac{3}{7}$  (d)  $\frac{53}{366}$

## Section - 'B'

11. Find the roots of the following equations:

$$x - \frac{1}{x} = 0, x \neq 0$$

12. In a flower bed, there are 23 rose plants in the first row, 21 in the second, 19 in the third, and so on. There are 5 rose plants in the last row. How many rows are there in the flower bed?
13. Prove that in two concentric circles, the chord of the larger circle, which touches the smaller circle, is bisected at the point of contact.
14. The wheels of a car are of diameter  $80\text{ cm}$  each. How many complete revolutions does each wheel make in 10 minutes when the car is travelling at a speed of  $66\text{ km per hour}$ ?
15. A cubical block of side  $7\text{ cm}$  is surmounted by a hemisphere. What is the greatest diameter the hemisphere can have? Find the surface area of the solid.
16. In what ratio does the point  $(-4, 6)$  divide the line segment joining the points  $A(-6, 10)$  and  $B(3, -8)$ ?
17. In  $(8, 1), (k, -4), (2, -5)$ , find the value of ' $k$ ', for which the points are collinear.
18. One card is drawn from a well-shuffled deck of 52 cards. Calculate the probability that the card will
- (i) be an ace, (ii) not be an ace

**"OR"**

Two players, Sangeeta and Reshma, play a tennis match. It is known that the probability of Sangeeta winning the match is  $0.62$ . What is the probability of Reshma winning the match?

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## Section - 'C'

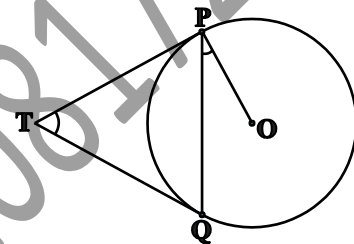
19. A motor boat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.

**“OR”**

A pole has to be erected at a point on the boundary of a circular park of diameter 13 meters in such a way that the differences of its distances from two diametrically opposite fixed gates A and B on the boundary are 7 metres. Is it possible to do so? If yes, at what distances from the two gates should the pole be erected?

20. How many multiples of 4 lie between 10 and 250?

21. In fig: Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that  $\angle PTQ = 2 \angle OPQ$ .

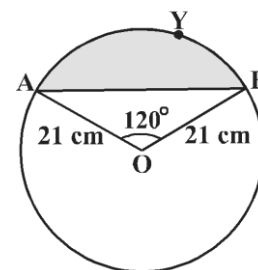


**“OR”**

Two concentric circles are of radii 5 cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle.

22. Construct an isosceles triangle whose base is 8 cm and altitude 4 cm and then another triangle whose sides are 1.5 times the corresponding sides of the isosceles triangle

23. In fig. Find the area of the segment AYB if radius of the circle is 21 cm and  $\angle AOB = 120^\circ$ .



24. A *fez*, the cap used by the Turks, is shaped like the frustum of a cone. If its radius on the open side is 10 cm, radius at the upper base is 4 cm And its slant height is 15 cm, find the area of material used for making it



**“OR”**

Water in a canal, 6 m wide and 1.5 m deep, is flowing with a speed of 10 km/h. How much area will it irrigate in 30 minutes, if 8 cm of standing water is needed?

25. Two poles of equal heights are standing opposite each other on either side of the road, which is 80 m wide. From a point between them on the road, the angles of elevation of the top of the poles are  $60^\circ$  and  $30^\circ$ , respectively. Find the height of the poles and the distances of the point from the poles.

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26. Determine the ratio in which the line  $2x + y - 4 = 0$  divides the line segment joining the points  $A(2, -2)$  and  $B(3, 7)$ .
27. Find a relation between  $x$  and  $y$  if the points  $(x, y)$ ,  $(1, 2)$  and  $(7, 0)$  are collinear.
28. A jar contains 24 marbles, some are green and others are blue. If a marble is drawn at random from the jar, the probability that it is green is  $\frac{2}{3}$ . Find the number of blue balls in the jar.

## Section – 'D'

29. The difference of squares of two numbers is 180. The square of the smaller number is 8 times the larger number. Find the two numbers.

“OR”

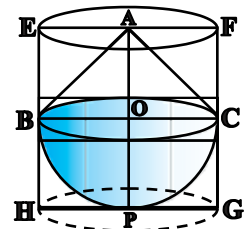
Sum of the areas of two squares is 468 m<sup>2</sup>. If the difference of their perimeters is 24 m, find the sides of the two squares

30. A manufacturer of TV sets produced 600 sets in the third year and 700 sets in the seventh year. Assuming that the production increases uniformly by a fixed number every year, find :
- (i) the production in the 1st year                      (ii) the production in the 10th year  
(iii) the total production in first 7 years

31. Prove that the parallelogram circumscribing a circle is a rhombus.
32. A solid toy is in the form of a hemisphere surmounted by a right circular cone.

The height of the cone is 2 cm and the diameter of the base is 4 cm.

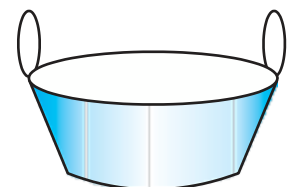
Determine the volume of the toy. If a right circular cylinder circumscribes the toy, find the difference of the volumes of the cylinder and the toy. (Take  $\pi = 3.14$ )



“OR”

A container, opened from the top and made up of a metal sheet, is in the form of a frustum of a cone of height 16 cm with radii of its lower and upper ends as 8 cm and 20 cm, respectively. Find the cost of the milk which can completely fill the container, at the rate of Rs 20 per litre. Also find the cost of metal sheet used to make the container, if it costs Rs 8 per 100 cm<sup>2</sup>. (Take  $\pi = 3.14$ )

33. Hanumappa and his wife Gangamma are busy making jaggery out of sugarcane juice. They have processed the sugarcane juice to make the molasses, which is poured into moulds in the shape of a frustum of a cone having the diameters of its two circular faces as 30 cm and 35 cm and the vertical height of the mould is 14 cm.
- If each cm<sup>3</sup> of molasses has mass about 1.2 g, find the mass of the molasses that can be poured into each mould



34. From a point on a bridge across a river, the angles of depression of the banks on opposite sides of the river are 30° and 45°, respectively. If the bridge is at a height of 3 m from the banks, find the width of the river

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## M. C.Q. Answers:

- |      |       |
|------|-------|
| 1. b | 6. c  |
| 2. d | 7. a  |
| 3. a | 8. b  |
| 4. d | 9. b  |
| 5. a | 10. a |

All other questions are from NCERT. Check your textbook for Answers.

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