

JSUNIL TUTORIAL : Class 10 Maths 2020 Sample Paper 01

General Instructions :

1. This question paper contains two parts A and B.
2. Both Part A and Part B have internal choices.

Part - A :

1. It consists two sections- I and II.
2. Section I has 16 questions of 1 mark each. Internal choice is provided in 5 questions.
3. Section II has 4 questions on case study. Each case study has 5 case-based sub-parts. An examinee is to attempt any 4 out of 5 sub-parts.

Part - B :

1. Section III, Question No 21 to 26 are Very short answer Type questions of 2 marks each,
2. Section IV, Question No 27 to 33 are Short Answer Type questions of 3 marks each
3. Section V, Question No 34 to 36 are Long Answer Type questions of 5 marks each.
4. Internal choice is provided in 2 questions of 2 marks, 2 questions of 3 marks and 1 question of 5 marks.

PART-A

Section-I

Section I has 16 questions of 1 mark each. Internal choice is provided in 5 questions.

1. What is the product of a non-zero rational and an irrational number? xy xy^2
OR
If two positive integers a and b are written as $a = x^3y^2$ and $b = xy^3$; where x, y are prime numbers, then HCF of a and b .
2. If one of the zeroes of the cubic polynomial $x^3 + ax^2 + bx + c$ is -1 , then the product of the other two zeroes. $1 + b - a$
OR
Is equation $x^2 + x - 5 = 0$ has two distinct real roots? $D < 0$, yes
Justify
3. $AOBC$ is a rectangle whose three vertices are vertices $A(0, 3)$, $O(0, 0)$ and $B(5, 0)$. What is the length of the diagonal? $\sqrt{34}$
4. What is the diameter of a circle whose area is equal to the sum of the areas of the two circles of radii 24 cm and 7 cm is. 25
5. If two solid hemispheres of same base radius ' r ' are joined together along their bases, then curved surface area of this new solid. $4\pi r^2$

6. It is given that $\triangle ABC \sim \triangle DFE$, $\angle A = 30^\circ$, $\angle C = 50^\circ$, $AB = 5$ cm, $AC = 8$ cm and $DF = 7.5$ cm. Then, $DE = 12$ cm, $\angle F = 100^\circ$ is true or not, justify. **Y**
7. What is the coordinates of the point which lies on the perpendicular bisector of the line segment joining the points $A(-2, -5)$ and $B(2, 5)$. **(0, 0)**
8. If all the zeroes of a cubic polynomial are negative, then what are the signs of all the coefficients and the constant term of the polynomial? **Same sign**
9. Find the solution of pair of equations $y = 0$ and $y = -7$. **- No Sol.**

OR

If the lines given by $3x + 2ky = 2$ and $2x + 5y + 1 = 0$ are parallel, then the value of k ? **15/4**

- Q10.** If the common difference of an A.P is 5, then find the value of $a_{18} - a_{13}$. **25**
11. If we draw any line from the centre of the circle to the tangent, then find the angle between them. **90°**
12. From an external point P , tangents PA and PB are drawn to a circle with centre O . If $\angle PAB = 50^\circ$, then find $\angle AOB$. **100°**
13. If $\tan(3x + 30^\circ) = 1$, then find the value of x . **5**
14. If the circumferences of two concentric circles forming a ring are 88 cm and 66 cm respectively. Find the width of the ring. **14, 10.5, 3.5**
15. Volume and surface area of a solid hemisphere are numerically equal. What is the diameter of hemisphere? **r = 3**

OR

Find the number of solid spheres of diameter 6 cm can be made by melting a solid metallic cylinder of height 45 cm and diameter 4 cm. **5**

16. Find the median of the data, using an empirical relation between mean, median and mode when it is given that Mode = 12.4 and Mean = 10.5. **11.13**

Section-II

Case study based questions are compulsory. Attempt any four sub parts of each question. Each subpart carries 1 mark

Q17. Case Study based-1 :

In a potato race, a bucket is placed at the starting point, which is 5 m from the first potato, and the other potatoes are placed 3 m apart in a straight line. There are ten potatoes in the line (see figure below).



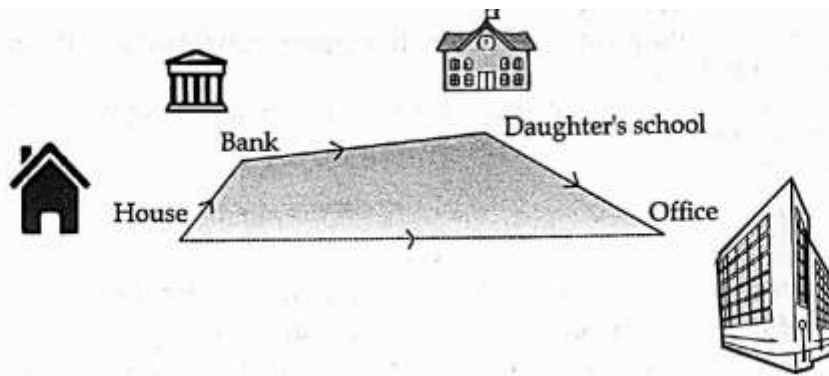
A competitor starts from the bucket, picks up the nearest potato, runs back with it, drops it in the bucket, runs back to pick up the next potato, runs to the bucket to drop it in, and she continues in the same way until all the potatoes are in the bucket.

- (a) What is the distance travelled by competitor to pick 1st potato?
 (i) 10 (ii) 16 (iii) 22 (iv) 48
- (b) What is the distance travelled by competitor to pick 2nd potato?
 (i) 10 (ii) 16 (iii) 22 (iv) 48
- (c) What is the distance travelled by competitor to pick 3rd potato?
 (i) 10 (ii) 16 (iii) 22 (iv) 48
- (d) The given problem is based on which concept?
 (i) AP (ii) GP (iii) HP (iv) None of these
- (e) Find the total distance travelled by the competitor?
 (i) 300 (ii) 370 (iii) 730 (iv) 700

Q18. Case Study based-2 :

Ayush Starts walking from his house to office. Instead of going to the office directly, he goes to a bank first, from there to his daughter's school and then reaches the office.

(Assume that all distances covered are in straight lines). If the house is situated at $(2, 4)$, bank at $(5, 8)$, school at $(13, 14)$ and office at $(13, 26)$ and coordinates are in km.

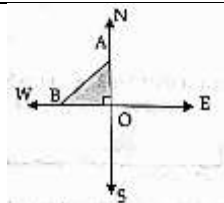


- (a) What is the distance between house and bank?
 (i) 5 (ii) 10 (iii) 12 (iv) 27
- (b) What is the distance between Daughter's School and bank?
 (i) 5 (ii) 10 (iii) 12 (iv) 27
- (c) What is the distance between house and office?
 (i) 24.6 (ii) 26.4 (iii) 24 (iv) 26
- (d) What is the total distance travelled by Ayush to reach the office?
 (i) 5 (ii) 10 (iii) 12 (iv) 27
- (e) What is the extra distance travelled by Ayush?
 (i) 2 (ii) 2.2 (iii) 2.4 (iv) none of these

AI 19. Case Study based-3 :

An aeroplane leaves an airport and flies due north at a speed of 1,000 km per hour. At the same time, another aeroplane leaves the same airport and flies due west at a speed of 1,200 km per hour.

- (a) What is the distance travelled by aeroplane towards north after $1\frac{1}{2}$ hours?
 (i) 1000 (ii) 1200 (iii) 1500 (iv) 1800
- (b) What is the distance travelled by aeroplane towards west after $1\frac{1}{2}$ hours?
 (i) 1000 (ii) 1200 (iii) 1500 (iv) 1800
- (c) $\angle AOB$ is
 (i) 90° (ii) 45° (iii) 30° (iv) 60°
- (d) How far apart will be the two planes after $1\frac{1}{2}$ hours ?
 (i) $\sqrt{22,50,000}$ (ii) $\sqrt{32,40,000}$ (iii) $\sqrt{54,90,000}$ (iv) none of these
- (e) The given problem is based on which concept?
 (i) Triangles (ii) Co-ordinate geometry
 (iii) Height and Distance (iv) None of these

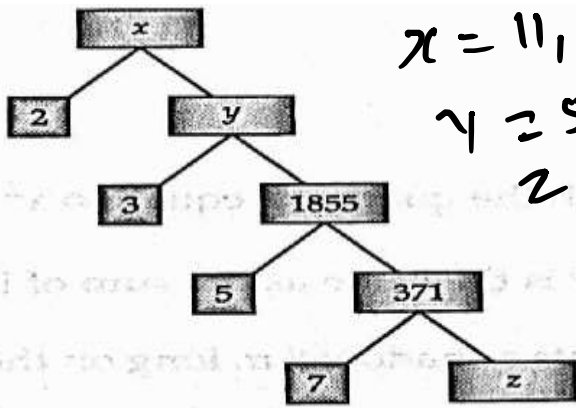


AI 20. Case Study based-4 :

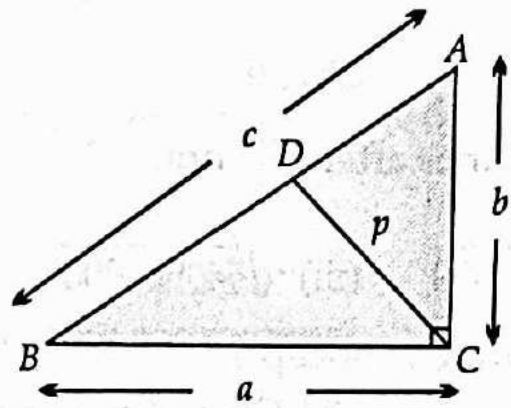
A horse is tied to a peg at one corner of a square shaped grass field of sides 15 m by means of a 5 m long rope (see the given figure).

- (a) What is the area of the grass field?
 (i) 225 m^2 (ii) 225 m (iii) 255 m^2 (iv) 15 m
- (b) The area of that part of the field in which the horse can graze.
 (i) 19.625 m^2 (ii) 19.265 m^2 (iii) 19 m^2 (iv) 78.5 m^2
- (c) The grazing area if the rope were 10 m long instead of 5 m.
 (i) 7.85 m^2 (ii) 785 m^2 (iii) 225 m^2 (iv) 78.5 m^2
- (d) The increase in the grazing area if the rope were 10 m long instead of 5 m.
 (i) 58.758 m^2 (ii) 58.875 m^2 (iii) 58 m^2 (iv) 78.5 m^2
- (e) The given problem is based on which concept?
 (i) Coordinate geometry (ii) Area related to circles
 (iii) Circle (iv) None of these

AI 21. Complete the following factor tree and find the composite number x :



$x = 11,130$
 $y = 5565$
 $z = 53$



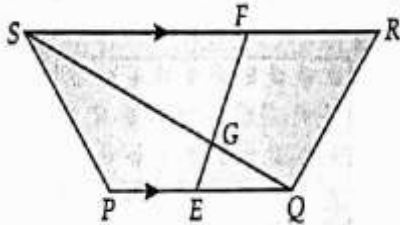
22. ABC is a right triangle, right angled at C . Let $BC = a, CA = b, AB = c$ and p be the length of perpendicular from C to AB . Prove that $cp = ab$.

OR

$\frac{1}{2}cp = \frac{1}{2}ab$

In the figure, $PQRS$ is a trapezium in which $PQ \parallel RS$. On PQ and RS , there are points E and F respectively such that EF intersects SQ at G . Prove that $EQ \times GS = GQ \times FS$.

$\triangle GEQ \sim \triangle GFS$



23. Find $\operatorname{cosec} 30^\circ$ and $\cos 60^\circ$ geometrically.

OR

Prove that : $\frac{(\sin^4 \theta + \cos^4 \theta)}{1 - 2\sin^2 \theta \cos^2 \theta} = 1$

- 24. From the top of light house, 40 m above the water, the angle of depression of a small boat is 60° . Find how far the boat is from the base of the light house. $40\sqrt{3}/3$
- 25. Find the area of the square that can be inscribed in a circle of radius 8 cm. 128
- 26. The mean and median of 100 observations are 50 and 52 respectively. The value of the largest observation is 100. It was later found that it is 110 not 100. Find the true mean and median. Mean = 50.1
Median = 52

Section-IV

All questions are compulsory. In case of internal choices, attempt any one.

AI 27. Determine the values of m and n so that the following system of linear equations have infinite number of solutions :

$17/4, 11/5$

$(2m - 1)x + 3y - 5 = 0$
 and $3x + (n - 1)y - 2 = 0$

OR,

AI Solve for x and y :

$\frac{x}{2} + \frac{2y}{3} = -1$

$2x = -3$
 $x = -3/2$

and $x - \frac{y}{3} = 3$

AI 28. Write all the values of p for which the quadratic equation $x^2 + px + 16 = 0$ has equal roots. Find the roots of the equation so obtained. $\pm 4, \pm 4,$

29. If the sum of first m terms of an AP is the same as the sum of its first n terms, show that the sum of its first $(m + n)$ terms is zero.

30. A vertical row of trees 12 m long casts a shadow 8 m long on the ground, At the same time a tower casts the shadow 40 m long on the ground. Find height of Tower? 60 m

31. AB is a chord of circle with centre O . At B , a tangent PB is drawn such that its length is 24 cm. The distance of P from the centre is 26 cm. If the chord AB is 16 cm, find its distance from the centre. **8cm**

OR

Prove that the lengths of two tangents drawn from an external point to a circle are equal.

32. One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting (a) Non face card, (b) Black king or a Red queen, (c) Spade card.

$$\frac{40}{52}, \frac{4}{52}, \frac{13}{52}$$

33. Prove that : $(\cot \theta - \operatorname{cosec} \theta)^2 = \frac{1 - \cos \theta}{1 + \cos \theta}$

Section-V

All questions are compulsory. In case of internal choices, attempt any one.

34. If roots of the quadratic equation $x^2 + 2px + mn = 0$ are real and equal, show that the roots of the quadratic equation $x^2 - 2(m+n)x + (m^2 + n^2 + 2p^2) = 0$ are also equal. **$p^2 = mn$;**

35. If $P(9a - 2, -b)$ divides the line segment joining $A(3a + 1, -3)$ and $B(8a, 5)$ in the ratio 3 : 1. Find the values of a and b . **1, -3**

36. Two points A and B are on the same side of a tower and in the same straight line with its base. The angle of depression of these points from the top of the tower are 60° and 45° respectively. If the height of the tower is 15 m, then find the distance between these points. **$15 - 5\sqrt{3}$**

OR

37. A man on a cliff observes a boat at an angle of depression of 30° which is approaching the shore to the point immediately beneath the observer with a uniform speed. Six minutes later, the angle of depression of the boat is found to be 60° .

Find :

- (i) Time taken by boat to reach the shore.
(ii) Which concept used in this question?

**9 min
Height and Distance**

Best of Luck

I love Sir

