Parikshit Yadav
10-B

11 In ...

# RYAN GROUP OF SCHOOLS

## ACADEMIC YEAR 2023–24

## CBSE, PRE–BOARD–2 EXAMINATION

**STD : X** **MARKS : 80**

**SUB : MATHS (STANDARD) (SET–B)** **TIME : 3 HRS.**

***General Instructions :***

1. ***This question paper has 5 sections A, B, C, D and E.***
2. ***Section A has 20 MCQs carrying 1 mark each.***
3. ***Section B has 5 questions carrying 2 marks each.***
4. ***Section C has 6 questions carrying 3 marks each.***
5. ***Section D has 4 questions carrying 5 marks each.***
6. ***Section E has 3 case based integrated units of assessment (4 marks each) with sub–parts of the values of 1,1 and 2 marks each respectively.***
7. ***All questions are compulsory. However, an internal choice in 2 questions of 5 marks, 2 questions of 3 marks and 2 questions of 2 marks has been provided. An internal choice has been provided in the 2 marks questions of section E.***
8. ***Draw neat figures wherever required. Take $\pi=22/7$ wherever required if not stated.***

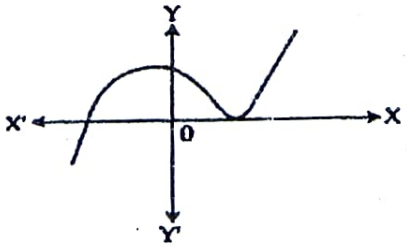
## SECTION – A

**Section A consists of 20 questions of 1 mark each.**

Q.1 If HCF (a, 8) = 4, LCM (a, 8) = 24, then a is

(a) 12 (b) 36 (c) 1 (d) 60

Q.2 The graph of y = p(x) is given below. The number of zeroes of p(x) are)




(a) 2 (b) 3 (c) 1 (d) 0

Q.3 One equation of a pair of dependent linear equations is $-5x+7y=2$, the second equation can be:

a) $10x + 14y + 4 = 0$ b) $-10x - 14y + 4 = 0$

c) $-10x + 14y + 4 = 0$ d) $10x - 14y = -4$

Q.4 The nature of roots of the quadratic equation $9x^2 - 6x - 2 = 0$

(a) No real roots (b) 2 equal real roots

(c) 2 distinct real roots (d) more than 2 real roots

Q.5 If $a+1$ , $2a+1$ , $4a-1$ are in AP , Then the value of a is :

(a) 1 (b) 2 (c) 3 (d) 4

Q.6 What is the ratio in which the line segment joining (2, -3) and (5, 6) is divided by x-axis?

(a) 1:2 (b) 2:1 (c) 2:5 (d) 5:2

Q.7 Find the value of 'a' so that the point (3,a) lies on the line represented by $2x - 3y = 5$

a) $\frac{2}{3}$ b) $\frac{1}{3}$ c) 1 d) 0

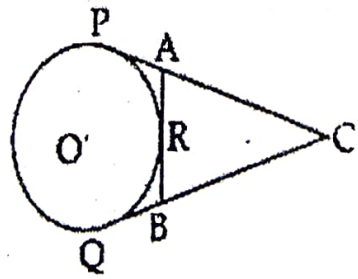
Q.8 If the ratio of the corresponding sides of two similar triangles is 3:4, then the ratio of their perimeters is:

a) 3:4 b) 4:3 c) 9:16 d) 16:9

Q.9 PQ is a tangent to a circle with centre O at point P. If $\Delta OPQ$ is an isosceles triangle, then find $\angle OQP$.

a) $45^0$ b) $15^0$ c) $75^0$ d) $60^0$

Q.10 CP and CQ are tangents to a circle with centre O. ARB is another tangent touching the circle at R. If CP=11cm, BC=7cm, then the length BR is:

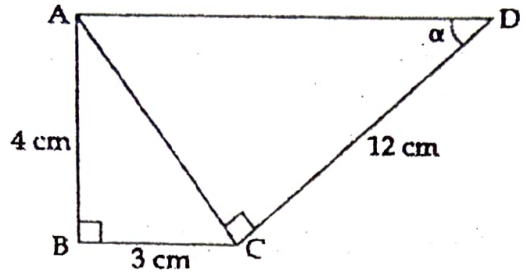



a) 11cm b) 7cm c) 3cm d) 4cm

11 In $\Delta ABC$, $C=90^0$ then the value of $\sin^2A + \sin^2B$ is :

a) 1 b) $\frac{1}{4}$ c) $\frac{3}{4}$ d) 0

Q.12 In figure below sec $\alpha$ is:




a) $\frac{13}{12}$ b) $\frac{12}{13}$ c) $\frac{12}{5}$ d) 1

Q.13 If the ratio of height of a tower and the length of its shadow on the ground is $\sqrt{3}:1$, then the angle of elevation of sun is

a) $60^0$ b) $45^0$ c) $30^0$ d) $90^0$

Q.14 The perimeter of a quadrant of a circle of radius $\frac{7}{2}$ cm is

a) 3.5cm b) 5.5cm c) 7.5cm d) 12.5cm

Q.15 The diameter of circle whose area is equal to sum of area of two circles of diameter 16cm and 12cm is:

a) 56cm b) 42cm c) 28cm d) 20cm

Q.16 Find the probability of getting a sum of 9 , when two dice are thrown simultaneously.

(a) $\frac{1}{9}$ (b) $\frac{4}{9}$ (c) $\frac{2}{9}$ (d) $\frac{2}{36}$

Q.17 From the deck of playing cards all aces and clubs are removed, a card is drawn at random from the remaining cards. Find the probability that it is a red card.

(a) $\frac{2}{3}$ (b) $\frac{26}{52}$ (c) $\frac{26}{36}$ (d) $\frac{2}{36}$

Q.18 For the following distribution :

| Class | 0–5 | 5 – 10 | 10– 15 | 15 – 20 | 20– 25 |
|---|---|---|---|---|---|
| Frequency | 10 | 15 | 12 | 20 | 9 |

the sum of lower limit of the median class and modal class is

(a) 10 (b) 15 (c) 25 (d) 20

**Direction**: In the following questions Q19 & Q20, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as:

Q.19 **Assertion**: Total surface area of the cylinder having radius of the base 14 cm and height 30 cm is 3872 $cm^2$.
**Reason**: If r be the radius and h be the height of the cylinder, then total surface area = $(2\pi rh + 2\pi r^2)$.

(a) Both Assertion (A) & Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) & Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true but Reason (R) is false.
(d) Assertion (A) is false but Reason (R) is true.

Q.20 **Assertion**: the value of n, if a=10, d=5, $a_n$=95, then n=18.
**Reason**: the formula of general term $a_n$ is $a_n = a+(n-1)d$.

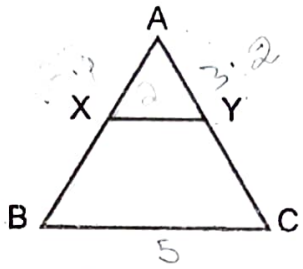
(a) Both Assertion (A) & Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).
(b) Both Assertion (A) & Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).
(c) Assertion (A) is true but Reason (R) is false.
(d) Assertion (A) is false but Reason (R) is true

## SECTION–II

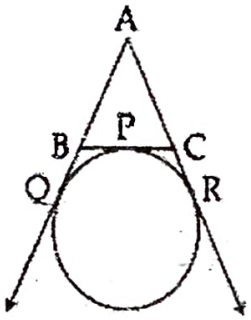
**Section B consists of 5 questions of 2 marks each.**

Q.21 Prove that $\sqrt{3}$ is an irrational number.

Q.22 In given figure XY || BC, the lengths of AX, AY, XY and BC in centimeters are 2.4, 3.2, 2 and 5 respectively. Find XB and YC.




Q.23 In given figure, a circle touches the side BC of $\Delta ABC$ at P and touches AB and AC produced at Q and R respectively. If AQ=5cm. Find the perimeter of $\Delta ABC$.



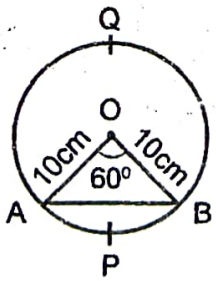

Q.24 If $\sin(A+B) = \cos(A-B) = \frac{\sqrt{3}}{2}$ and A, B (A>B) are acute angles, find the values of A and B.

**OR**

Find the value of x if

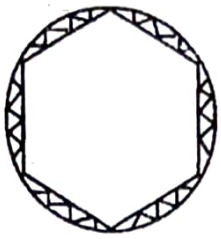
$$2\,\text{cosec}^2 30 + x \sin^2 60 - \frac{3}{4}\tan^2 30 = 10$$

Q.25 Find the area of the sector of a circle with radius 10cm and of central angle $60^0$. Also, find the area of the corresponding major sector.



**OR**

A round table cover has six equal designs as shown in figure. If the radius of the cover is 28cm, find the cost of making the designs at the rate of Rs. 0.35 per $cm^2$. (use $\sqrt{3} = 1.7$)



## SECTION – III

**Section C consists of 6 questions of 3 marks each.**

Q.26 A forester wants to plant 66 apple trees, 88 banana trees, and 110 mango trees in equal rows. Find the number of minimum rows required.

Q.27 Find the zeroes of the quadratic polynomial $3x^2 - 75$ and verify the relationship between the zeroes and the coefficients.

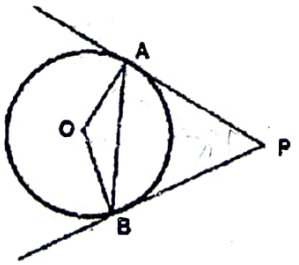
Q.28 A two digit number is four times the sum of its digits. It is also equal to three time product of its digits. Find the number.

**OR**

Find the value of 'P' for which the quadratic equation $px(x - 2) + 6$ has two equal roots.

Q.29 PA and PB are tangents drawn to a circle of centre O from an external point P, Chord AB makes an angle of $30^\circ$ with the radius at the point of contact.

If length of the chord is 6cm, find the length of the tangent PA and the length of the radius OA.



**OR**

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

Q.30 Prove that $\frac{\sin\theta - \cos\theta + 1}{\sin\theta + \cos\theta - 1} = \frac{1}{\sec\theta - \tan\theta}$

Q.31 Find the missing frequency for the given frequency distribution table, if the mean of the distribution is 18.

| C.I. | 11-13 | 13-15 | 15-17 | 17-19 | 19-21 | 21-23 | 23-25 |
|---|---|---|---|---|---|---|---|
| Frequency | 3 | 6 | 9 | 13 | f | 5 | 4 |

## SECTION - IV

**Section D consists of 4 questions of 5 marks each.**

Q.32 A train covers a distance of 480 km at a uniform speed. If the speed had been 8km/hr less than it would have taken 3 hours more to cover the same distance. Find the speed of the train.

**OR**

The sum of the ages of a father and his son is 45 years . five years ago , the product of their ages was 124 years. determine their present ages

.33 State and prove Basic Proportionality theorem.

.34 A solid wooden toy is in the form of cone mounted on a hemisphere. If the radii of hemisphere and base of cone are 4.2cm each and the total height of toy is 10.2cm, find the volume of wood used in the toy. Also find the total surface area of toy.

**OR**

A circus tent is the form of right circular cylinder and right circular cone above it. The diameter and height of cylindrical part of tent at 126m and 5m respectively. The total height of tent is 21m. Find the total cost of tent if the canvas used costs Rs. 12 per $m^2$.

Q.35 The median of the distribution given below is 35. Find the value of x and y, if the sum all frequencies is 170.

| Variable | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 |
|---|---|---|---|---|---|---|---|
| Frequency | 10 | 20 | x | 40 | y | 25 | 15 |

## SECTION - E

Q.36 Jack is much worried about his upcoming assessment on AP. He was vigorously practicing for the exam but unable to solve some questions. one of the question is shown below.

If the 3rd and 9th term of an AP are –4 and –8, then help jack in solving the problem:

(i) What is the first term ? **(1)**

(ii) Which term of an AP is –160 ? **(1)**

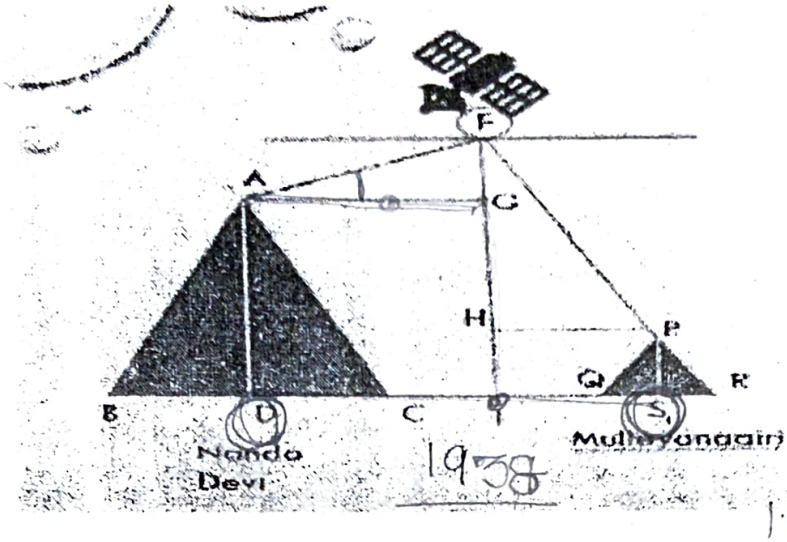
(iii) What is the 75th term of AP? **(2)**

**OR**

Find the sum of first 10 terms of the AP.

Q.37 A Satellite flying at height h is watching the top of the two tallest mountains in Uttarakhand and Karnataka, them being Nanda Devi (height 7,816m) and Mullayanagiri (height 1,930m). The angles of depression from the satellite, to the top of Nanda Devi and Mullayanagiri are $30^0$ and $60^0$ respectively. If the distance between the foot of two mountains is 1938km. The satellite is vertically above the

midpoint of the distance between the two mountains.

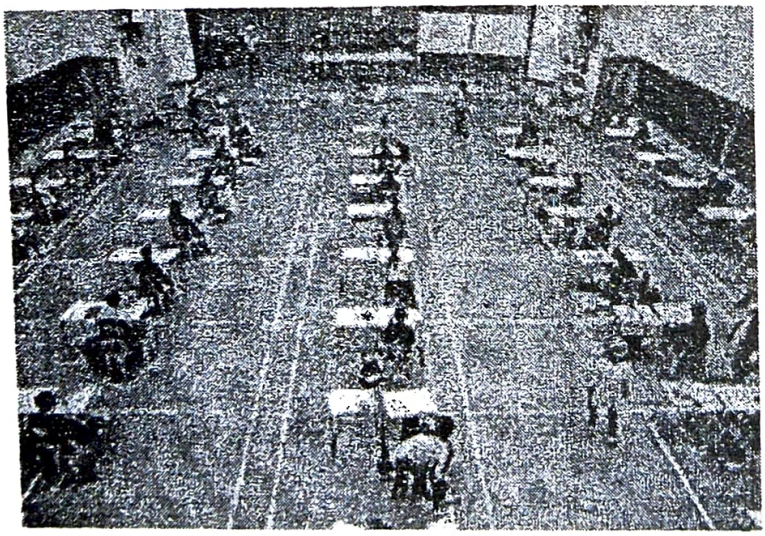



1. Fine the distance of the satellite from the top of Nanda Devi. **(1)**
2. Find the distance of the satellite from the top of Mullayanagiri. **(1)**
3. Find the distance of the satellite from the ground.

**OR**

If Sun's altitude is 45° then find the length of shadow of Nanda Devi. **(2)**

Q.38 Social distancing in Examination hall



In an examination hall, students are seated at a distance of 2m from each other, to maintain the social distance due to CORONA virus pandemic. Let three students sit at point A, B And C whose coordinates are (4, –3), (7, 3) and (8, 5) respectively.

**Read the information and answer the following question:**

i) Find the Distance between A and C. **(1)**

ii) Find the mid point of the line joining A and C. **(1)**

iii) If an invigilator at point' L ', lying on the straight line joining B and C such that it divided the distance between them in the ratio 1:2, then find the coordinates of point 'L'. **(2)**

**OR**

If point M lies on x axis and equidistant from A and B, find the coordinates of M.

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