CBSE Class 10 Maths (Standard) Question Paper 2020 Set 2

CLASS: X **MATHEMATICS STANDARD**

SET 2 SOLVED (CODE 30/5/2)

General Instructions:

Read the following instructions very carefully and strictly follow them:

i. This question paper comprises four sections – A, B, C and D. This question paper carries 40 questions. All questions are compulsory.
ii. Section A: Question numbers 1 to 20 comprises of 20 questions of one mark each.
iii. Section B: Question numbers 21 to 26 comprises of 6 questions of two marks each.
iv. Section C: Question numbers 27 to 34 comprises of 8 questions of three marks each.
v. Section D: Question numbers 35 to 40 comprises of 6 questions of four marks each.
vi. There is no overall choice in the question paper. However, an internal choice has been provided in 2 questions of one mark, 2 questions of two marks, 3 questions of three marks and 3 questions of four marks. You have to attempt only one of the choices in such questions.
vii. In addition to this, separate instructions are given with each section and question, wherever necessary.
viii. Use of calculators is not permitted.

SECTION – A

Question numbers 1 to 20 carry 1 mark each.

Question numbers 1 to 10 are multiple choice questions.

Choose the correct option.

1. The value (s) of k for which the quadratic equation 2x2 + kx + 2 = 0 has equal roots, is

   (a) 4 (b) ± 4 (c) – 4 (d) 0

2. Which of the following is not an A.P?

   (a) – 1.2, 0.8, 2.8, ….

   (b) $3, 3+\sqrt{2}, 3+2\sqrt{2}, 3+3\sqrt{2}$

   (c) $\frac{4}{3}, \frac{7}{3}, \frac{9}{3}, \frac{12}{3}, \ldots$

   (d) $\frac{-1}{5}, \frac{-2}{5}, \frac{-3}{5}, \ldots$

3. In figure – 3, from an external point P, two tangents PQ and PR are drawn to a circle of radius 4 cm with centre O. If ∠QPR = 90°, then length of PQ is

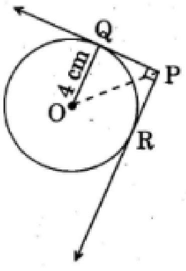


Figure-3

(a) 3 cm (b) 4 cm (c) 2 cm (d) $2\sqrt{2}\,cm$

4. The distance between the points (m, -n) and (-m, n) is

(a) $\sqrt{m^2+n^2}$ (b) m + n (c) $2\sqrt{m^2+n^2}$ (d) $\sqrt{2m^2+2n^2}$

5. The degree of polynomial having zeroes -3 and 4 only is

(a) 2 (b) 1 (c) more than 3 (d) 3

6. In figure - 1, ABC is an isosceles triangle, right angled at C. Therefore

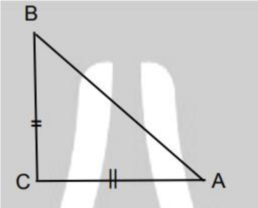


figure - 1

(a) AB^2 = 2AC^2 (b) BC^2 = 2AB^2 (c) AC^2 = 2AB^2 (d) AB^2 = 4AC^2

7. The point on the x-axis which is equidistant from (– 4, 0) and (10, 0) is

(a) (7, 0) (b) (5, 0) (c) (0, 0) (d) (3, 0)

OR

The centre of a circle whose end point of a diameter are (-6, 3) and (6, 4) is

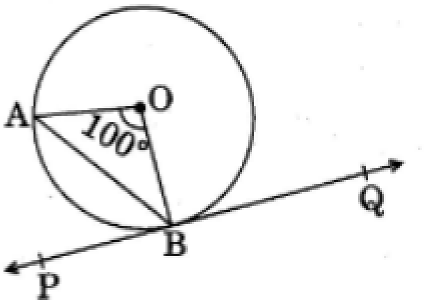
(a) (8, - 1) (b) (4, 7) (c) $\left(0, \frac{7}{2}\right)$ (d) $\left(4, \frac{7}{2}\right)$

8. The pair of linear equations $\frac{3x}{2}+\frac{5y}{3}=7\ and\ 9x+10y=14$ is

(a) consistent (b) inconsistent (c) consistent with one solution

(d) consistent with many solutions.

9. In figure - 2, PQ is tangent to the circle with centre at O, at the point B. If ∠AOB= 100°, then ∠ABP is equal to



(a) 50° (b) 40° (c) 60° (d) 80°

10. The radius of a sphere (in cm) whose volume is 12π Cm^3, is

(a) 3 (b) $3\sqrt{3}$ (c) $3^{\frac{2}{3}}$ (d) $3^{\frac{1}{3}}$

Fill in the blanks in questions numbers 11 to 15

11. AOBC is a rectangle whose three vertices are A(0, – 3), O(0, 0) and B(4, 0). The length of its diagonals is _________________.

12. In the formula $\overline{x} = a + \left(\frac{\Sigma f_i u_i}{\Sigma f_i}\right) \times h \quad , u_i =$ ________________

13. All concentric circles are ____________ to each other.

14. The probability of an event that is sure to happen, is ________

15. Simplest from of (1 – cos^2 A) (1 + cot^2 A) is __________

Answer the following question numbers 16 to 20

16. The LCM of two numbers is 182 and their HCF is 13. If one of the numbers is 26, find the other,

17. Form a quadratic polynomial, the sum and product of whose zeroes are (-3) and 2 respectively.

(Or)

Can (x^2 - 1) be a remainder while dividing x^4 – 3x^2 + 5x – 6 by (x^2 + 3)?

18. Find the sum of the first 100 natural numbers.

19. Evaluate:

2 sec 30° × tan 60°

20. In figure – 4, the angle of elevation of the top of a tower from a point C on the ground, which is 30 m away from the foot of the tower, is 30°. Find the height of the tower.

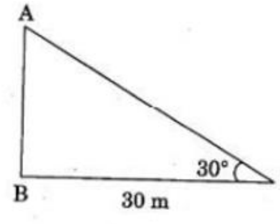


Figure-4

SECTION – B

Question numbers 21 to 26 carry 2 marks each.

21. Find the mode of the following distribution.

Marks	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Number of students	4	6	7	12	5	6

22. In figure – 6, a quadrilateral ABCD is drawn to circumscribe a circle. Prove that AB + CD = BC + AD.

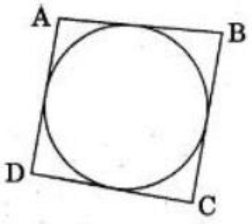


Figure-6

(OR)

In figure – 7, find the perimeter of ΔABC, if AP = 12 cm.

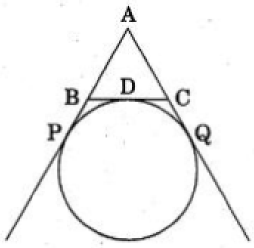


Figure-7

23. How may cubes of side 2 cm can be made from a solid cube of side 10 cm?

24. In the figure – 5, DE || AC and DF || AE.

Prove that $\frac{BF}{FE} = \frac{BE}{EC}$

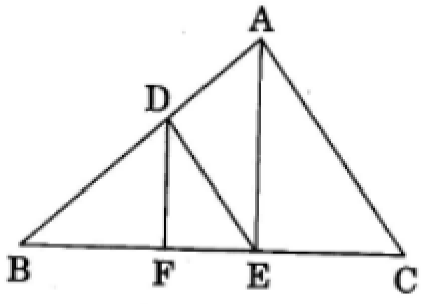


Figure-5

25. Show that $5+2\sqrt{7}$ is an irrational number, where $\sqrt{7}$ is given to be an irrational number.

Let $5+2\sqrt{7}$ be rational.

(OR)

Check whether 12^n can end with the digit 0 for any natural number n.

$12^n = (2 \times 2 \times 3)^n$

26. If A, B and C are interior angles of a ΔABC, then show that $\cot\left(\frac{B+C}{2}\right) = \tan\frac{A}{2}$

SECTION –C

Question numbers 27 to 34 carry 3 marks each.

27. In figure-9, a square OPQR is inscribed in a quadrant OAQB of a circle. If the radius of circle is $6\sqrt{2}$ cm, find the area of the shaded region.

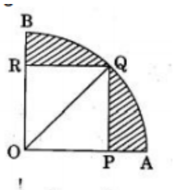


Figure-9

28. Construct a ΔABC with sides BC = 6 cm, AB = 5 cm and ∠ABC = 60°. Then construct a triangle whose sides are $\frac{3}{4}$ of the corresponding sides of ΔABC.

(OR)

Draw a circle of radius 3.5 cm. Take a point P outside the circle at a distance of 7 cm from the centre of the circle and construct a pair of tangents to the circle from that point.

29. Prove that:

$$\frac{2\cos^3\theta - \cos\theta}{\sin\theta - 2\sin^3\theta} = \cot\theta$$

30. A fraction becomes $\frac{1}{3}$ when 1 is subtracted from the numerator and it becomes $\frac{1}{4}$ when 8 is added to its denominator. Find the fraction.

(OR)

The present age of a father is three years more than three times the age of his son. Three years hence the father's age will be 10 years more than twice the age of the son. Determine their present ages.

31. Using Euclid's Algorithm, find the largest number which divides 870 and 258 leaving remainder 3 in each case.
32. Find the ratio in which the y-axis divides the line segment joining the points (6, -4) and (-2, -7). Also find the point of intersection.

(OR)

Show that the points (7, 10), (-2, 5) and (3, -4) are vertices of an isosceles right triangle.

33. In an A.P. given that the first term (a) = 54, the common difference (d) = – 3 and the nth term (a_n) = 0, find n and the sum of first n terms (S_n) of the A.P.
34. Read the following passage and answer the questions given at the end :

Diwali Fair

A game in a booth at a Diwali Fair involves using a spinner first. Then, if the spinner stops on an even number, the player is allowed to pick a marble from a bag. The spinner and the marbles in the bage are respresented in Figure - 8. Prizes are given, when a black marbles is picked. Shweta plays the same once.

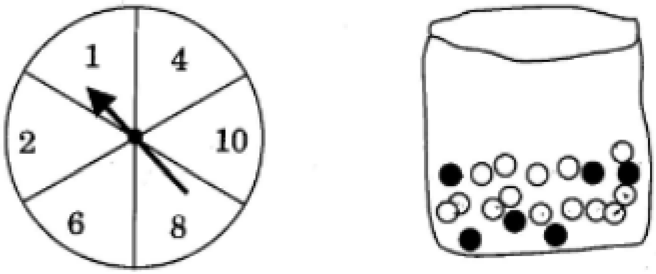


Figure-8

(i) What is the probability that she will be allowed to pick a marble from the bag ?

(ii) Suppose she is allowed to pick a marble from the bag, what is the probability of getting a prize, When it is given that the bag contains 20 balls out of which 6 are black ?

SECTION – D

Question numbers 35 to 40 carry 4 marks each.

35. Sum of the areas of two squares is 544 m^2 . If the diffeence of their perimeter is 32 m, find the sides of the two squares.

(OR)

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

36. A solid toy is in the form of a hemisphere surmounted by a right circular cone of same radius. The height of the cone is 10 cm and the radius of the base is 7 cm. Determine the volume of the toy. Also find the area of the coloured sheet required to cover the toy. $\left(Use\ \pi=\frac{22}{7}\ and\ \sqrt{149}=12.2\right)$

37. For the following data, draw a ‘less than’ ogive and hence find the median of the distribution.

Less than frequency distribution

Age (in years)	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70
Number of persons	5	15	20	25	15	11	9

(OR)

The distribution given below shows the number of wickets taken by bowlers in one-day cricket matches. Find the mean and the median of the number of wickets taken.

38. From a point on the ground, the angles of elevation of the bottom and the top of a transmission tower fixed at the top of a 20 m high building are 45° and 60° respectively. Find the height of the tower.
$\left(Use\sqrt{3}=1.73\right)$

39. Prove that in a right angled triangle the square of hypotenuse is equal to the sum of square of other two sides.

40. Obtain other zeroes of the polynomial $p(x) = 2x^4 – x^3 – 11x^2 + 5x + 5$ if two of its zeroes are $\sqrt{5}$ and $-\sqrt{5}$.

(OR)

What minimum must be added to $2x^3 – 3x^2 + 6x + 7$ so that the resulting polynomial will be divisible by $x^2 – 4x + 8$?

CBSE Class 10 Maths (Standard) Question Paper Solution 2020 Set 2

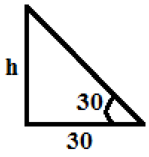
CLASS: X

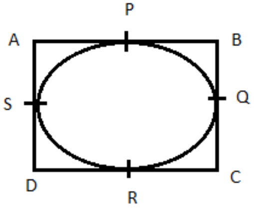
MATHEMATICS STANDARD SOLVED

SET 2 (CODE: 30/5/2) SERIES: JBB/5

Q. NO	SOLUTION	MARKS
	SECTION – A	
1.	(B) ± 4	1
2.	(C) $\frac{4}{3}, \frac{7}{3}, \frac{9}{3}, \frac{12}{3}, \ldots$	1
3.	(B) 4 cm	1
4.	(C) $2\sqrt{m^2+n^2}$	1
5.	(A) 2	1
6.	(A) $AB^2 = 2AC^2$	1
7.	(D) (3, 0) OR (C) $\left(0, \frac{7}{2}\right)$	1 1
8.	(B) inconsistent	1
9.	(A) 50°	1
10.	(C) $3^{\frac{2}{3}}$	1
11.	5 units	1

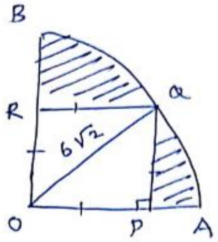
12.	$u_i = \frac{x_i - a}{h}$ $x_i -$ class mark a – assumed mean h – class size	1
13.	Similar	1
14.	1	1
15.	$\left(1-\cos^2 A\right)\left(1+\cot^2 A\right) = \sin^2 A \times \operatorname{cos}ec^2 A = 1$	1
16.	LCM × HCF = Product 182 × 13 = 2 6 × x $x = \frac{182 \times \cancel{13}}{\cancel{26}\,2}$ x = 91 Other number = 91	 ½ ½
17.	$k\left[x^2 + 3x + 2\right]$ **OR**	1

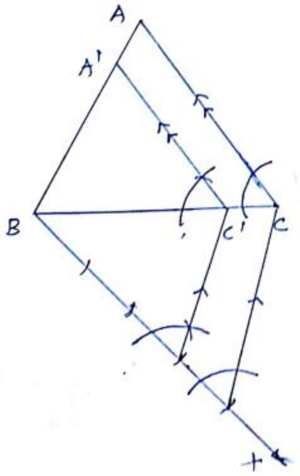
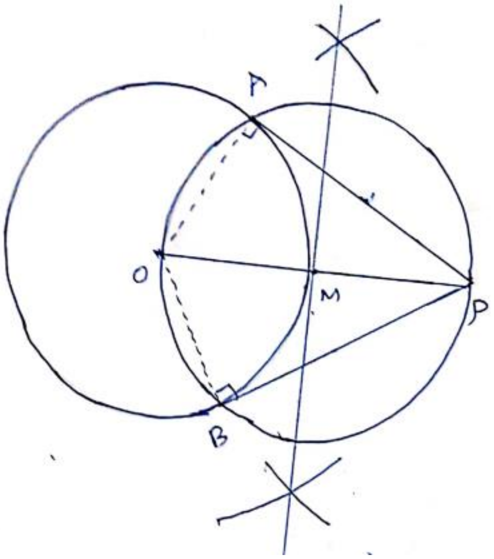
	No. x^2-1 can't be remainder. Because degree of the remainder should be less than the degree of the divisor.	1
18.	$S_n = \frac{n(n+1)}{2}$ $S_{100} = \frac{100\times101}{2} = 5050$	½ ½
19.	2 sec 30 × tan 60 $=2\times\frac{2}{\sqrt{3}}\times\sqrt{3}=4$	½ + ½
20.	 $\tan 30=\frac{1}{\sqrt{3}}=\frac{h}{30}$ $h=\frac{30}{\sqrt{3}}=10\sqrt{3}m$	½ ½
	SECTION – B	
21.	Modal class : 30 – 40 $\ell=30,\ f_1=12,\ f_0=7,\ f_2=5,\ h=10$ $mod\ e = \ell+\left[\frac{f_1-f_0}{2f_1-f_0-f_2}\right]\times h$ $=30+\left[\frac{12-7}{24-7-5}\times 10\right]$	½ ½

	$= 30 + \left[\frac{5}{12} \times 10\right]$ $= 30 + \frac{50}{12} = 30 + 4.16..$ $= 34.17$	1
22.	Let P, Q, R and S be point of contact.  	½
	$\left.\begin{array}{l} AP = AS \\ BP = BQ \\ CQ = CR \\ DS = DR \end{array}\right] \text{Tangents drawn from external point of circle}$	½
	AB + CD = AP + BP + CR + RD = AS + BQ + CQ + DS = AS + DS + BQ + CQ = AD + BC	1
	Hence proved. **(OR)** Perimeter of ΔABC = AB + BC + AC	½
	= AB + BD + CD + AC = AB + BP + CQ + AC [Since BD = BP and CD = CQ]	½

	= AP + AQ = 2AP [AP = AQ, Tangents drawn from external point] = 2 × 12 = 24 cm.	½ ½
23.	Number of small cubes made $= \frac{\text{Volume of cube of side 10 cm}}{\text{Volume of cube of side 2 cm}}$ $= \frac{10\times10\times10}{2\times2\times2} = 125$ 125 cubes can be made.	1 1
24.	Given DE ∥ AC $BPT \Rightarrow \frac{BE}{EC} = \frac{BD}{AD}$ ......1 $and, DF \parallel AC$ $By\ BPT \Rightarrow \frac{BF}{FE} = \frac{BD}{AD}$ ......2 $From 1 and 2$ $\frac{BE}{EC} = \frac{BF}{FE}$ Hence proved.	½ ½ 1
25.	Let $5+2\sqrt{7}$ be rational. So $5 + 2\sqrt{7} = \frac{a}{b}, where'a'and'b'are\ integersb \neq 0$	½

	$2\sqrt{7}=\frac{a}{b}-5$ $2\sqrt{7}=\frac{a-5b}{5}$ $\sqrt{7}=\frac{a-5b}{2b}$ Since 'a' and 'b' are integers a – 5b is also an integer. $\frac{a-5b}{2b}$ is rational. So RHS is rational. LHS should be rational. but it is given that $\sqrt{7}$ is irrational .Our assumption is wrong. So $5+2\sqrt{7}$ is an irrational number. **(OR)** $12^n = (2 \times 2 \times 3)^n$ If a number has to and with digit 0. It should have prime factors 2 and 5. By fundamental theorem of arithmetic, $12^n = (2 \times 2 \times 3)^n$ It doesn't have 5 as prime factor. So 12^n cannot end with digit 0.	½ 1 1 1
26.	Given A, B and C are interior angles of ΔABC So $A + B + C = 180$ $B + C = 180 - A$ $\frac{B+C}{2}=\frac{180-A}{2}=90-\frac{A}{2}$ $\frac{B+C}{2}=90-\frac{A}{2}$	1

	$\cot\left(\frac{B+C}{2}\right)=\cot\left(90-\frac{A}{2}\right)$ $\cot\left(\frac{B+C}{2}\right)=\tan\frac{A}{2}$	1
	SECTION – C	
27.	Given,  Radius of circle r = $6\sqrt{2}$ OA = OB = OQ = $6\sqrt{2}$ cm In Δ OPQ, $(OP)^2 + (PQ)^2 = (OQ)^2$ $2(OP)^2 = \left(6\sqrt{2}\right)^2$ a = op = 6 cm Area of the shaded region = ar (quadrant, with r = $6\sqrt{2}$) – ar (square with side 6 cm) $= [\frac{1}{4}\pi \times r^2] - a^2$ $= [\frac{1}{4} \times 3.14 \times \left(6\sqrt{2}\right)^2] - 6^2$ $= [18\ x\ 3.14] - 36 = 56.52 - 36$ $= 20.52cm^2(app)$	1 1 1

28.	For correct construction of Δ ABC AB = 5 cm, BC= 6 cm , $\angle B = 60°$ A’B C’ is required similar Δ. A’ B C’ is similar to ABC $\frac{A'B}{AB} = \frac{BC'}{BC} = \frac{A'C'}{AC} = \frac{3}{4}$ For correct construction of similar triangle with scale factor ¾  OR 	1 2

	For correct construction of given circle OP = 7cm , OA = OB = 3.5 cm. PA and PB are required tangents to the circle with centre O. For correct construction of tangents	1 2
29.	LHS : $\frac{2\cos^3\theta-\cos\theta}{\sin\theta-2\sin^3\theta}=\frac{\cos\theta\left[2\cos^2\theta-1\right]}{\sin\theta\left[1-2\sin^2\theta\right]}$ $=\frac{\cot\theta\left[2\left(1-\sin^2\theta\right)-1\right]}{1-2\sin^2\theta}$ $=\frac{\cot\theta\left[2-2\sin^2\theta-1\right]}{\left(1-2\sin^2\theta\right)}=\frac{\cot\theta\left[1-2\sin^2\theta\right]}{1-2\sin^2\theta}$ $=\cot\theta$	1 1 1
30.	Let the fraction be $\frac{x}{y}$ as per the question, $\frac{x-1}{y}=\frac{1}{3}$ 3x – 3 = y 3x – y = 3 ……………. 1 and, $\frac{x}{y+8}=\frac{1}{4}$ 4x = 8 + y 4x – y = 8 ……………. 2 By elimination,	1 ½

$$\Theta \begin{array}{l} 3x - y = 3 \\ \underline{4x - y = 8} \end{array}$$

$$-x = -5$$

$$x = 5$$

$$Put\ x = 5 in 1$$

$$15 - y = 3$$

$$y = 12$$ 1 + ½

$$\therefore The required\ fraction is \frac{5}{12}$$

OR

Let the present age of son be ‘x’ years

	Father	Son
Present age	3x + 3	X
Three years hence	3x + 6	x + 3

1

As per question,

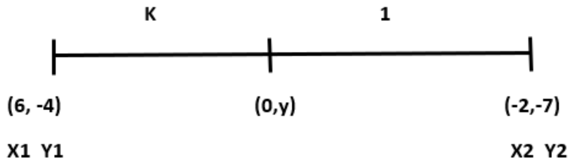
$$3x + 6 = 10 + 2 (x + 3)$$

$$3x + 6 = 10 + 2x + 6$$

$$x = 10$$ 1

Father’s present age = 3x + 3

$$= 3 \times 10 + 3 = 33$$

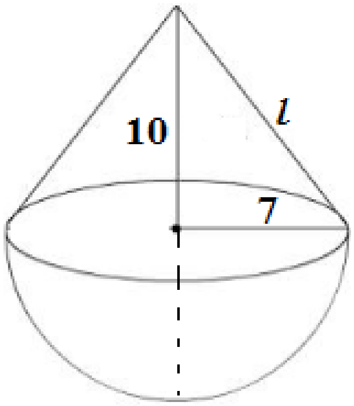
	∴ Present age of son = 10 years Present age of father = 33 years	1
31.	Required number = HCF [870 – 3, 258 - 3] = HCF [867, 255] 867 = 255 × 3 + 102 (by EDL) 255 = 102 × 2 + 51 102 = 51 × 2 HCF = 51 ∴ Required number = 51	1 2
32.	Y axis divides the line segment . Any point on y – axis is of the form (o, y) As per the question  As per section formula, $P(x,y) = \left(\frac{kx_2+x_1}{k+1}, \frac{ky_2+y_1}{k+1}\right)$	½ ½

	$= \left(\frac{-2k+6}{k+1}, \frac{-7k-4}{k+1}\right)$	
	$\frac{-2k+6}{k+1} = 0$	
	$-2k+6=0$	
	$2k=6$	
	$k=3$	
	$\therefore Ratio 3:1$	1
	$y = \frac{-7k-4}{k+1} = \frac{-21-4}{4} = \frac{-25}{4}$	
	$\therefore Point\ of\ intersection \left(0, \frac{-25}{4}\right)$	1
	(OR)	
	Distance between 2 points $= \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$ $(x_1,y_1)\ (x_2,y_2)$	½
	$AB = \sqrt{9^2+5^2} = \sqrt{81+25} = \sqrt{106}$	
	$BC = \sqrt{5^2+9^2} = \sqrt{25+81} = \sqrt{106}$	
	$CA = \sqrt{4^2+14^2} = \sqrt{16+196} = \sqrt{212}$	1 + ½
	(by Pythagoras theorem)	
	$AB^2 + BC^2 = AC^2$	
	$\left(\sqrt{106}\right)^2 + \left(\sqrt{106}\right)^2 = \left(\sqrt{212}\right)^2$ 106 + 106 = 212	
	$\therefore$ ABC is an isosceles right angled Δ.	1
33.	Given: a = 54	

	d = -3 $n=?$ $a_n=0$ $S_n=?$ $a_n=a+(n-1)d=0$ $54+(n-1)(-3)=0$ $(n-1)(-3)=-54$ $(n-1)=18$ $n=19$ $S_n=\frac{n}{2}[a+a_n]$ $S_{19}=\frac{19}{2}[54+0]=19\times27=513$ $n=19,\quad S_n=513$	½ 1 ½ 1
34.	(i) P(to pick a marble from the bag) = P(spinner stops an even number) A = {2, 4, 6, 8, 10} n (A) = 5 n (S) = 6 $\Rightarrow P(A)=\frac{n(A)}{n(S)}=\frac{5}{6}$	½ 1

	(ii) P(getting a prize) = P(bag contains 20 balls out of which 6 are black) $= \frac{6}{20} = \frac{3}{10}$	½ 1
SECTION – D		
35.	Let the sides of the two squares be x and y (x > Y) difference of perimeter is = 32 4x – 4y = 32 X – y = 8 ➔ y = x – 8 Sum of area of two squares = 544 $x^2 + y^2 = 544$ $x^2 + (x – 8)^2 = 544$ $x^2 + x^2 + 64 – 16\ x = 544$ $2x^2 – 16x = 480$ ÷2, $x^2 – 8x = 240$ $x^2 – 8x – 240 = 0$ (x – 20) (x + 12) = 0 X = 20,- 12	1 2

	Side can’t be negative.	
	So x = 20	
	y = x – 8 = 20 – 8 = 12	
	∴ Sides of squares are 20 cm,12cm	1
	(OR)	
	Speed of boat = 18 km/hr	
	Let speed of the stream be =*x* km/hr	
	Speed of upstream $=(18-x)km/hr$	
	Speed of downstream $=(18+x)km/hr$	
	Distance = 24 km	
	Time $=\frac{\text{Distance}}{\text{Speed}}$	1
	As per question,	
	$\frac{24}{18-x}-\frac{24}{18+x}=1$	1
	$24\left[\frac{1}{18-x}-\frac{1}{18+x}\right]=1$	
	$\frac{18+x-18+x}{(18-x)(18+x)}=\frac{1}{24}$	
	$\frac{2x}{324-x^2}=\frac{1}{24}$	
	$324-x^2=48x$	

	$x^2+48x-324=0$ $(x+54)(x-6)=0$ $x=6,\ -54$ $\therefore\quad x=6\ km/hr$ Speed of stream $=6\ km/hr$	2
36.	Volume of the toy = Volume of cone + Volume of hemisphere  Cone: r = 7 cm h = 10 cm Hemisphere: r = 7 cm Volume of toy $=\frac{1}{3}\pi r^2 h+\frac{2}{3}\pi r^3$	1

$$=\frac{1}{3}\pi r^2\left[h+2r\right]$$

$$=\frac{1}{3}\times\frac{22}{7}\times 7\times 7\left[10+14\right]$$

$$=\frac{1}{3}\times 22\times 7\times 24$$

Volume of toy $=1232\,cm^3$ 1

Area of coloured sheet required to cover the toy = CSA of cone + CSA of hemisphere ½

$$=\pi rl+2\pi r^2$$

$$=\pi r\left[l+2r\right]$$

$$=\frac{22}{7}\times 7\left[12.2+14\right]$$

$l^2=10^2+7^2$

$l^2=100+49$

$l=\sqrt{149}$

$l=12.2$ ½

$$=22\times 26.2$$

$$=576.4\,cm^2$$ 1

37.

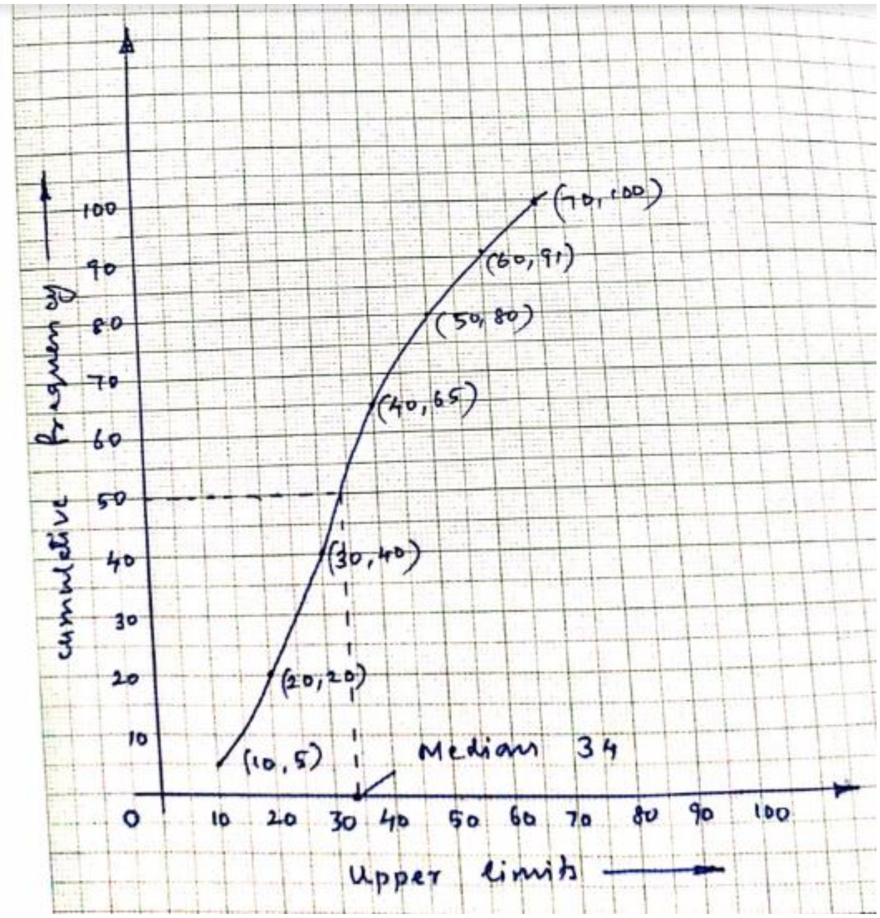
Age	No. of persons	Class	CF
0 – 10	5	Less than 10	5
10 – 20	15	Less than 20	20

20 – 30	20	Less than 30	40
30 – 40	25	Less than 40	65
40 – 50	15	Less than 50	80
50 – 60	11	Less than 60	91
60 – 70	9	Less than 70	100

Coordinates to plot less than ogive: (10, 5) (20, 20) (30, 40) (40, 65) (50, 80) (60, 91)(70, 100)

2

N = 100 , N/2 = 50 Median = 34



2

(OR)

To find mean

Number of wickets	**Number of bowlers (f)**	**xi**	$u_i = \frac{x_i - a}{h}$	**$u_i f_i$**
20 – 60	7	40	-3	-21
60 – 100	5	80	-2	-10
100 – 140	16	120	-1	-16
140 – 180	12	160	0	0
180 – 220	2	200	1	2
220 – 260	3	240	2	6
	45			**-39**

1

Assumed mean a = 160

Class size h = 40

$$Mean\ \bar{x} = a + \left(\frac{\sum f_i u_i}{\sum f_i} \times h\right)$$

$$= 160 + \left(\frac{\cancel{-39}\ -13}{\cancel{45}\ \cancel{9}\ 3} \times \cancel{40}\right)$$

$$= 160 + \left(\frac{-104}{3}\right)$$

$$= 160 - 34.66\ ...$$

$$= 160 - 34.67$$

$$\bar{x} = 125.33$$

1

To find median,

Number of workers CI	**No. of bowlers (f)**	**CF**
20 – 60	7	7
60 – 100	5	12
100 – 140	16	28
140 – 180	12	40
180 – 220	2	42
220 – 260	3	45

1

N = 45, > N/2 ➔ > 22.5

Median class: 100 – 140

F = 16 h = 40

CF = 12 l = 100

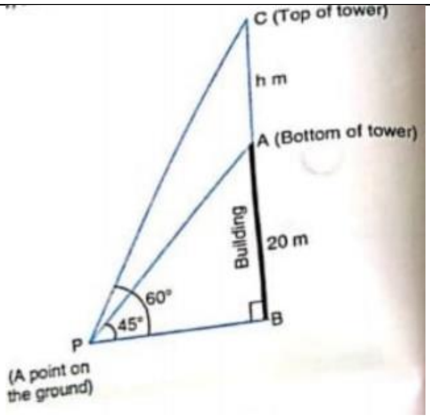
$$Median=\ell+\left(\frac{{}^{N}\!/_{2}-CF}{f}\times h\right)$$

$$=100+\left(\frac{\frac{45}{2}-12}{\cancel{16}\,4}\times\cancel{40}\,10\right)$$

$$=100+\frac{105}{4}=100+26.25$$

$$=126.25$$

1

38.	 Let the height of the tower be *h* m. Then, in right triangle CBP, $\tan 60^o = \frac{BC}{BP}$ $\Rightarrow \quad \sqrt{3} = \frac{AB+AC}{BP}$ $\sqrt{3} = \frac{20+h}{BP}$ ….. (i) In right triangle ABP, $\tan 45^o = \frac{AB}{BP}$ $\Rightarrow \quad 1 = \frac{20}{BP}$ …… (ii) Dividing (1) by (2), we get	1 1

	$\sqrt{3} = \frac{20+h}{20}$ $\Rightarrow \quad 20\sqrt{3} = 20 + h$ $\Rightarrow \quad h = 20\sqrt{3} - 20$ $\Rightarrow \quad h = 20\left(\sqrt{3} - 1\right)$ Hence, the height of the tower $20\left(\sqrt{3}-1\right)m$ =20(1.73-1)=20 x 0.73= 14.6 m	2
39.	For correct Given, to prove, Construction and figure For Correct proof Pythagoras theorem proof: Refer NCERT text book Pg: No. 145	½ x 4 = 2 2
40.	p(x) = $2x^4 – x^3$ -11 x^2 + 5x + 5 Two zeros are $\sqrt{5}\, and -\sqrt{5}$ $\therefore x = \sqrt{5} \quad x = -\sqrt{5}$ $\left(x-\sqrt{5}\right)\left(x+\sqrt{5}\right) = x^2 - 5$ is a factor of p(*x)* To find other zeroes $2x^2 - x - 1$ $x^2 - 5 \,\Big)\, 2x^4 - x^3 - 11x^2 + 5x + 5$ $\overset{-}{2x^4} \quad \overset{+}{- 10x^2}$ $- x^3 - x^2 + 5x$ $\overset{+}{- x^3} \quad \overset{-}{+ 5x}$ $- x^2 + 5$ $- x^2 + 5$ 0	1

	$\therefore 2x^2 - x - 1 \, is \, a \, factor$	2
	$2x^2 - 2x + x - 1 = 0$ $2x (x - 1) + 1 (x - 1) = 0$ $(2x + 1) \qquad (x - 1) = 0$ $x = -1/2 \qquad x = 1$ $\therefore$ Other zeroes are -1/2, 1	1
	(OR)	
	$\begin{array}{r\|l} & 2x + 5 \\ \hline x^2 - 4x + 8 & 2x^3 - 3x^2 + 6x + 7 \\ & - \quad + \quad - \\ & 2x^3 - 8x^2 + 16x \\ \hline & 5x^2 - 10x + 7 \\ & - \quad + \quad - \\ & 5x^2 - 20x + 40 \\ \hline & 10x - 33 \\ \hline \end{array}$	3
	So -10x + 33 has to be added	1