General Instruction:
(i) All the questions are compulsory.
(ii) The question paper consists of 40 questions divided into 4 sections A, B, C, and D.
(iii) Section A comprises of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 8 questions of 3 marks each. Section D comprises of 6 questions of 4 marks each.
(iv) There is no overall choice. However, an internal choice has been provided in two questions of 1 mark each, two questions of 2 marks each, three questions of 3 marks each, and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
(v) Use of calculators is not permitted.

SECTION – A
Questions 1 to 20 carry 1 mark each.

1. The decimal expansion of $\frac{147}{120}$ will terminate after how many places of decimal?
   (a) 1  (b) 2  (c) 3  (d) will not terminate
   Ans: (c) 3

2. Euclid’s division lemma states that for two positive integers a and b, there exist unique integers q and r such that $a = bq + r$, where r must satisfy
   (a) $1 < r < b$  (b) $0 < r \leq b$  (c) $0 \leq r < b$  (d) $0 < r < b$
   Ans: (c) $0 \leq r < b$

3. Given that the LCM(91, 26) = 182, HCF(91, 26) is
   (a) 13  (b) 26  (c) 7  (d) 9
   Ans: (a) 13

4. The quadratic polynomial whose sum of zeroes is 3 and product of zeroes – 2 is
   (a) $x^2 + 3x - 2$  (b) $x^2 - 2x + 3$  (c) $x^2 - 3x + 2$  (d) $x^2 - 3x - 2$
   Ans: (d) $x^2 - 3x - 2$

5. If $\alpha$ and $\beta$ are the zeroes of $x^2 + 5x - 6$, then the value of $\alpha + \beta - \alpha \beta$
   (a) 1  (b) 2  (c) 3  (d) none of these
   Ans: (a) 1

6. The distance between the points A(0, 6) and B(0, –2) is
   (a) 6  (b) 8  (c) 4  (d) 2
   Ans: (b) 8

7. If $P \left(-\frac{a}{3}, 4\right)$ is the mid-point of the line segment joining the points Q (–6, 5) and R (–2, 3), then the value of a is
   (a) –4  (b) –12  (c) 12  (d) –6
   Ans: (c) 12

Prepared by: M. S. KumarSwamy, TGT(Maths)
8. TP and TQ are the two tangents to a circle with center O so that angle ∠POQ = 130°. Find ∠PTQ.
   (a) 50°  (b) 70°  (c) 80°  (d) none of these
   Ans: (a) 50°

9. For the following distribution:

<table>
<thead>
<tr>
<th>Class</th>
<th>0-5</th>
<th>5-10</th>
<th>10-15</th>
<th>15-20</th>
<th>20-25</th>
</tr>
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<tbody>
<tr>
<td>Frequency</td>
<td>10</td>
<td>15</td>
<td>12</td>
<td>20</td>
<td>9</td>
</tr>
</tbody>
</table>

the lower limit of the modal class is
   (a) 5    (b) 10   (c) 15   (d) 20
   Ans: (c) 15

10. Cards are marked with numbers 1 to 25 are placed in the box and mixed thoroughly. What is the probability of getting a number divisible by 5?
   (a) 1    (b) 0    (c) \frac{1}{25}    (d) \frac{1}{5}
   Ans: (d) \frac{1}{5}

11. The value of k will the pair of linear equations 3x + y = 1 and (2k – 1) x + (k – 1) y = 2k + 1 have no solution is ________
   Ans: k = 2

   OR

   The value of k for which the quadratic equation 4x^2 – 3kx + 1 = 0 has real and equal roots is ________
   Ans: k = ± \frac{4}{3}

12. The radius of the circle whose end points of diameter are (–4, 1), (2, –3).
   Ans: \sqrt{13}

13. If ΔABC is right angled at B, then the value of sin (A + C) is __________
   Ans: 1

14. If tanA = \frac{12}{5}, then the value of sinA is __________
   Ans: \frac{12}{13}

15. Let Δ ABC ~ Δ DEF and their areas be, respectively, 64 cm^2 and 121 cm^2. If EF = 15.4 cm, then the value of BC is __________
   Ans: 11.2 cm

16. In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. Find the length of the arc.
   Ans: 22 cm

17. A bag contains lemon flavoured candies only. Malini takes out one candy without looking into the bag. What is the probability that she takes out a lemon flavoured candy?
   Ans: 1

18. In ΔABC, right-angled at B, AB = 5 cm and ∠ACB = 30° then find the length of the side BC.
   Ans: BC = 5\sqrt{3} cm
OR

If \( \sin 30 = \cos (\theta - 6^\circ) \) here, \( 30 \) and \( (\theta - 6^\circ) \) are acute angles, find the value of \( \theta \).

**Ans:** \( \theta = 24^\circ \).

19. Which term of an AP, 21, 18, 15, ….. is zero?

**Ans:** 8th term

20. A ladder 10 m long reaches a window 8 m above the ground. Find the distance of the foot of the ladder from base of the wall.

**Ans:** 6 m

**SECTION – B**

Questions 21 to 26 carry 2 marks each.

21. A box contains 90 discs which are numbered from 1 to 90. If one disc is drawn at random from the box, find the probability that it bears (i) a two-digit number (ii) a perfect square number.

**Ans:** Total number of discs = 90  
(i) Number of discs with two digit numbers = 81

\[
\text{Required Probability} = \frac{81}{90} = \frac{9}{10}
\]

(ii) Number of discs with perfect square numbers = 9

\[
\text{Required Probability} = \frac{9}{90} = \frac{1}{10}
\]

OR

A die is thrown twice. What is the probability that (i) 5 will not come up either time? (ii) 5 will come up at least once?

**Ans:** Total number of outcomes = 36  
(i) Number of outcomes in which 5 will not come up either time = 25

\[
\text{Required Probability} = \frac{25}{36}
\]

(ii) Number of outcomes in which 5 will come up at least once = 11

\[
\text{Required Probability} = \frac{11}{36}
\]

22. A card is drawn at random from a pack of 52 playing cards. Find the probability that the card drawn is (a) a king of black colour (b) a face card.

**Ans:** Total number of cards = 52  
(i) Number of king of black colour cards = 2

\[
\text{Required Probability} = \frac{2}{52} = \frac{1}{26}
\]

(ii) Number of face cards = 12

\[
\text{Required Probability} = \frac{12}{52} = \frac{3}{13}
\]

23. Find the area of a quadrant of a circle whose circumference is 22 cm.

**Ans:** Given that circumference =22 cm

\[
2\pi r = 22
\]

\[
\Rightarrow 2 \times \frac{22}{\pi} \times r = 22 \Rightarrow r = \frac{7}{2} \text{ cm}
\]

\[
\text{Area of quadrant} = \frac{1}{4} \pi r^2 = \frac{1}{4} \times \frac{22}{\pi} \times \frac{7}{2} \times \frac{7}{2} = \frac{77}{8} \text{ cm}^2
\]
24. Evaluate: \( \sin 25^\circ \cos 65^\circ + \cos 25^\circ \sin 65^\circ \)

\[
\text{Ans: } \sin 25^\circ \cos (90^\circ - 25^\circ) + \cos 25^\circ \sin (90^\circ - 25^\circ) \\
= \sin 25^\circ \sin 25^\circ + \cos 25^\circ \cos 25^\circ \\
= 1 \\
\]

OR

If \( \tan A = \cot B \), prove that \( A + B = 90^\circ \).

\[
\text{Ans: } \tan A = \cot B = \tan (90^\circ - B) \\
\Rightarrow A = 90^\circ - B \\
\Rightarrow A + B = 90^\circ \\
\]

25. Divide \( p(x) = 3x^3 + x^2 + 2x + 5 \) by \( g(x) = 1 + 2x + x^2 \) and find the quotient and remainder.

\[
\text{Ans: } \\
\begin{array}{c|ccccc}
   & 3x - 5 \\
--- & --- & --- & --- & --- & --- \\
3x^3 & + & x^2 & + & 2x & + & 5 \\
- & 3x^3 & - & 6x^2 & - & 3x \\
--- & --- & --- & --- & --- & --- \\
5x^2 & - & x & + & 5 \\
- & -5x^2 & - & 10x & - & 5 \\
--- & --- & --- & --- & --- & --- \\
9x & + & 10 \\
\end{array}
\]

Quotient = \( 3x - 5 \)

Remainder = \( 9x + 10 \)

26. A quadrilateral \( ABCD \) is drawn to circumscribe a circle. Prove that \( AB + CD = AD + BC \)

\[
\text{Ans: } \\
\begin{array}{c}
\begin{array}{c}
\text{We know that the length of the tangents drawn from an external point to a circle are equal} \\
\text{Therefore, } AP = AS \text{ (tangent from } A) \\
BP = BQ \text{ (tangent from } B) \\
CR = CQ \text{ (tangent from } C) \\
DR = DS \text{ (tangent from } D) \\
\text{Now we add above all 4 equations,} \\
AP + BP + CR + DR = AS + BQ + CQ + DS \\
\Rightarrow AB + CD = AD + BC \\
\end{array}
\end{array}
\]

SECTION – C

Questions 27 to 34 carry 3 marks each.

27. Prove that \( \sqrt{3} \) is an irrational number.

\[
\text{Ans: Let } \sqrt{3} \text{ be a rational number} \\
\text{Therefore, } \sqrt{3} = p/q \text{ where } p, q \text{ are co-primes and } q \neq 0 \\
\text{On squaring both sides, we get } p^2 = 3q^2 \quad \text{...(1)} \\
\Rightarrow 3 \text{ is a factor of } p^2 \text{ [since, } 3q^2 = p^2] \Rightarrow 3 \text{ is a factor of } p \\
\text{Let } p = 3m \text{ for all } m \text{ (where } m \text{ is a positive integer)}
\]
Squaring both sides, we get \( p^2 = 9 \text{ m}^2 \) ...(2)
From (1) and (2), we get \( 3q^2 = 9\text{ m}^2 \) \( \Rightarrow q^2 = 3\text{ m}^2 \)
\( \Rightarrow 3 \) is a factor of \( q^2 \) [since, \( q^2 = 3\text{ m}^2 \)] \( \Rightarrow 3 \) is a factor of \( q \)
Thus, we see that both \( p \) and \( q \) have common factor 2 which is a contradiction that \( p, q \) are co-primes.
Therefore, Our assumption is wrong
Hence \( \sqrt{3} \) is not a rational number i.e., irrational number.

**OR**
Show that any positive odd integer is of the form \( 6q + 1 \), or \( 6q + 3 \), or \( 6q + 5 \), where \( q \) is some integer.

**Ans:** Let \( x \) be the positive odd integer which when divided by 6 gives \( q \) as quotient and \( r \) as remainder. According to Euclid’s division lemma
\[ x = bq + r \]
\( \Rightarrow x = 6q + r \) where , \( r = 0,1,2,3,4,5 \)
then, \( x = 6q \) or \( 6q + 1 \) or \( 6q+2 \) or \( 6q+3 \) or \( 6q+4 \) or \( 6q+5 \)
Now, \( 6q = 2 \times 3q \)
6q is an even integer
We know that the sum of two even integers is always an even integer
Therefore, \( 6q + 2 \) and \( 6q + 4 \) are even integers
We know that the sum of even and odd integer is always an odd integer.
Therefore, \( 6q + 1 \) , \( 6q + 3 \), \( 6q + 5 \) are odd integers
Hence, any positive odd integer is of the form \( 6q + 1 \), or \( 6q + 3 \), or \( 6q + 5 \), where \( q \) is some integer

28. Find the zeroes of the quadratic polynomial \( 6x^2 – 7x – 3 \) and verify the relationship between the zeroes and the coefficients of the polynomial.

**Ans:** \( 6x^2 – 7x – 3 = 0 \)
\( \Rightarrow 6x^2 – 9x + 2x – 3 = 0 \)
\( \Rightarrow 3x(2x - 3) + 1(2x - 3) = 0 \)
\( \Rightarrow (3x + 1) (2x - 3) = 0 \)
\( \Rightarrow x = \frac{-1}{3}, \frac{3}{2} \)
Now, \( \alpha + \beta = \frac{-1}{3} + \frac{3}{2} = \frac{-2 + 9}{6} = \frac{7}{6} \) and \( \frac{-b}{a} = \frac{7}{6} \Rightarrow \alpha + \beta = \frac{-b}{a} \)
\( \alpha \beta = \frac{-1}{3} \times \frac{3}{2} = \frac{-1}{2} \) and \( \frac{c}{a} = \frac{-1}{2} \Rightarrow \alpha \beta = \frac{c}{a} \)

29. Draw the graphs of the equations \( x – y + 1 = 0 \) and \( 3x + 2y – 12 = 0 \). Determine the coordinates of the vertices of the triangle formed by these lines and the x-axis.

**Ans:** Correct Graph
Coordinates of the vertices of the triangle are A(2, 3), B (4, 0) and C \((-1, 0)\).

30. In the below figure, OACB is a quadrant of a circle with centre O and radius 3.5 cm. If OD = 2 cm, find the area of the (i) quadrant OACB, (ii) shaded region.
Ans: (i) Area of the quadrant OACB = \( \frac{1}{4} \pi r^2 = \frac{1}{4} \times \frac{22}{7} \times \frac{7}{2} \times \frac{7}{2} = \frac{77}{8} \approx 9.625 \text{ cm}^2 \)

(i) Area of the \( \Delta BOD = \frac{1}{2} \times OB \times OD = \frac{1}{2} \times 3.5 \times 2 = 3.5 \text{ cm}^2 \)

Area of the shaded region = Area of the quadrant OACB – Area of the \( \Delta BOD \\
= 9.625 - 3.5 = 6.125 \text{ cm}^2 \)

31. To conduct Sports Day activities, in your rectangular shaped school ground ABCD, lines have been drawn with chalk powder at a distance of 1m each. 100 flower pots have been placed at a distance of 1m from each other along AD, as shown in the below figure. Niharika runs 1/4th the distance AD on the 2nd line and posts a green flag. Preet runs 1/5th the distance AD on the 8th line and posts a red flag.

(i) What is the distance between both the flags?

(ii) If Rashmi has to post a blue flag exactly halfway between the line segment joining the two flags, where should she post her flag?

Ans: It can be observed that Niharika posted the green flag at \( \frac{1}{4} \) of the distance AD i.e., \( \frac{1}{4} \times 100 = 25 \) m from the starting point of 2nd line. Therefore, the coordinates of this point G is (2, 25)

Similarly, Preet posted red flag at \( \frac{1}{5} \) of the distance AD i.e., \( \frac{1}{5} \times 100 = 20 \) m from the starting point of 8th line. Therefore, the coordinates of this point R are (8, 20)

Now we have the positions of posts by Preet and Niharika
Distance between these flags by using distance formula, 
\[ D = \frac{\sqrt{[(8 - 2)^2 + (25 - 20)^2]}}{2} = \sqrt{61} \text{m} \]

The point at which Rashmi should post her blue flag is the mid-point of the line joining these points. Let this point be A \((x, y)\)

Now by midpoint formula,
\[ x = 5 \text{ and } y = 22.5 \]

Hence, \(A(x, y) = (5, 22.5)\)

Therefore, Rashmi should post her blue flag at 22.5m on 5th line.

32. Prove that:
\[ \frac{\sin \theta - \cos \theta + 1}{\sin \theta + \cos \theta - 1} = \sec \theta + \tan \theta \]

Ans: LHS = \[\frac{\tan \theta - 1 + \sec \theta}{\tan \theta + 1 - \sec \theta}\]

\[= \frac{\tan \theta + \sec \theta - (\sec^2 \theta - \tan^2 \theta)}{\tan \theta + 1 - \sec \theta}\]

\[= \frac{\sec \theta + \tan \theta - (1 - \sec^2 \theta)}{\tan \theta + 1 - \sec \theta}\]

\[= \sec \theta + \tan \theta = \text{RHS}\]

OR

Prove that: \((\sin A + \cosec A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A\)

Ans: LHS = \((\sin A + \cosec A)^2 + (\cos A + \sec A)^2\)

\[= \sin^2 A + \cosec^2 A + 2\sin A\cosec A + \cos^2 A + \sec^2 A + 2\cos A\sec A\]

\[(\because 1 + \cot^2 A = \cosec^2 A, 1 + \tan^2 A = \sec^2 A)\]

\[= \sin^2 A + \cos^2 A + 1 + 1 + 1 + 2 \tan^2 A + \cosec^2 A\]

\[= 7 + \tan^2 A + \cot^2 A\]

\[= \text{RHS}\]

33. Construct a triangle \(ABC\) with \(BC = 7\) cm, \(\angle B = 60^\circ\) and \(AB = 6\) cm. Construct another triangle whose sides are \(\frac{3}{5}\) times the corresponding sides of \(\triangle ABC\).

Correct Construction of a triangle \(ABC\) with \(BC = 7\) cm, \(\angle B = 60^\circ\) and \(AB = 6\) cm

Correct Construction of another triangle whose sides are \(\frac{3}{5}\) times the corresponding sides of \(\triangle ABC\).

OR

Draw a line segment of length 10 cm and divide it in the ratio 3 : 5.

Ans: Correct line segment of length 10 cm

Correct division of line segment in the ratio 3 : 5

34. In the below figure, \(XY\) and \(X'Y'\) are two parallel tangents to a circle with centre \(O\) and another tangent \(AB\) with point of contact \(C\) intersecting \(XY\) at \(A\) and \(X'Y'\) at \(B\). Prove that \(\angle AOB = 90^\circ\).
In \( \triangle OPA \) and \( \triangle OCA \),

\( OP = OC \) (Radius of the same circle)
\( AP = AC \) (Tangents from point A)
\( AO = AO \) (Common side)

\( \triangle OPA \cong \triangle OCA \) (SSS congruence criterion)

\( \angle POA = \angle COA = \angle 1 \) \( \ldots \) (i)

Similarly, \( \triangle OQB \cong \triangle OCB \Rightarrow \angle QOB = \angle COB = \angle 2 \) \( \ldots \) (ii)

Since POQ is a diameter of the circle, it is a straight line.

Therefore, \( \angle POA + \angle COA + \angle COB + \angle QOB = 180^\circ \)

From equations (i) and (ii), it can be observed that \( 2\angle 1 + 2\angle 2 = 180^\circ \)

\( \angle 1 + \angle 2 = 180^\circ / 2 \Rightarrow \angle 1 + \angle 2 = 90^\circ \Rightarrow \angle AOB = 90^\circ \)

**SECTION – D**

Questions 35 to 40 carry 4 marks each.

35. 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.

Let A and B represent points on the bank on opposite sides of the river, so that AB is the width of the river. P is a point on the bridge at a height of 3 m, i.e., DP = 3 m.

Now, \( AB = AD + DB \)

In right \( \triangle APD, \angle A = 30^\circ \).

So, \( \tan 30^\circ = PD/AD \)

\[ \frac{1}{\sqrt{3}} = \frac{3}{AD} \Rightarrow AD = 3\sqrt{3} \text{ m} \]

Also, in right \( \triangle PBD, \angle B = 45^\circ \). So, \( BD = PD = 3 \text{ m} \).

Now, \( AB = BD + AD = 3 + 3\sqrt{3} = 3(1 + \sqrt{3}) \text{ m} \).

Therefore, the width of the river is \( 3(\sqrt{3} + 1) \text{ m} \).

36. 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.

Ans: Let the speed of the stream be \( x \) km/h.

Therefore, the speed of the boat upstream = \((18 - x)\) km/h and the speed of the boat downstream = \((18 + x)\) km/h.

The time taken to go upstream = distance/speed = \( \frac{24}{18 + x} \)
Similarly, the time taken to go downstream = \( \frac{24}{18 - x} \)

According to the question, \( \frac{24}{18 - x} - \frac{24}{18 + x} = 1 \)

\( \Rightarrow 24(18 + x) - 24(18 - x) = (18 - x)(18 + x) \)

\( \Rightarrow x^2 + 48x - 324 = 0 \)

\( \Rightarrow x = -6 \) or \(-54\)

Since \(x\) is the speed of the stream, it cannot be negative. So, we ignore the root \( x = -54 \).

Therefore, \( x = 6 \) gives the speed of the stream as 6 km/h.

37. If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289, find the sum of first \( n \) terms.

Ans: Given that, \( S_7 = 49 \) and \( S_{17} = 289 \)

\[ S_7 = \frac{7}{2} [2a + (n - 1)d] = \frac{7}{2} [2a + (7 - 1)d] \]

\[ 49 = \frac{7}{2} [2a + 16d] \Rightarrow 7 = (a + 3d) \Rightarrow a + 3d = 7 \ldots (i) \]

Similarly, \( S_{17} = \frac{17}{2} [2a + (17 - 1)d] \)

\[ 289 = \frac{17}{2} (2a + 16d) \Rightarrow 17 = (a + 8d) \Rightarrow a + 8d = 17 \ldots (ii) \]

Solving equation (i) and equation (ii), we get \( d = 2 \) and \( a = 1 \)

\[ S_n = \frac{n}{2} [2a + (n - 1)d] = \frac{n}{2} [2(1) + (n - 1) \times 2] \]

\[ = \frac{n}{2} (2 + 2n - 2) = \frac{n}{2} (2n) = n^2 \]

OR

How many terms of the AP: 9, 17, 25, \ldots must be taken to give a sum of 636?

Ans: Here; \( a = 9, \ d = 8 \) and \( S_n = 636 \)

We know that \( S_n = \frac{n}{2} [2a + (n - 1)d] \)

\( \Rightarrow 636 = \frac{n}{2} [2 \times 9 + (n - 1)8] \)

\( \Rightarrow 636 = n(9 + 4n - 4) \)

\( \Rightarrow n(4n + 5) = 636 \)

\( \Rightarrow 4n^2 + 5n - 636 = 0 \)

\( \Rightarrow n = \frac{-5 \pm \sqrt{5^2 - 4 \times 4 \times (-636)}}{2 \times 4} \)

\( \Rightarrow n = \frac{53}{4} \) and \( n = 12 \)

Taking the integral value, we have \( n = 12 \)

38. Prove that in a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides.

Given,

To Prove,

Construction,

Correct Figure

Correct Prove

OR

State and prove Basic proportionality theorem.

Statement

Given,
To Prove,
Construction,
Correct Figure
Correct Prove

39. A farmer connects a pipe of internal diameter 20 cm from a canal into a cylindrical tank in her
field, which is 10 m in diameter and 2 m deep. If water flows through the pipe at the rate of 3
km/h, in how much time will the tank be filled?

Ans: Diameter of the pipe = 20 cm ⇒ Radius, r of the pipe = 10 cm = \( \frac{1}{10} \) m
Diameter of the tank = 10 m ⇒ Radius of the tank, R = 5 m
Depth of the tank, H = 2 m
Length of the water flowing in 1 minute, h = 3 km/60 = 3000/60 = 50 m
Time taken to fill the tank = Volume of the tank/ Volume of water filled in 1 minute

\[ \frac{\pi R^2 H}{\pi r^2 h} = \frac{R^2 H}{r^2 h} \]
\[ = \frac{5 \times 5 \times 2}{\frac{1}{10} \times \frac{1}{10} \times 50} = 5 \times 5 \times 2 \times 2 = 100 \text{ minutes or 1 hour 40 minutes} \]

OR

A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of same radius. The
total height of the toy is 15.5 cm. Find the total surface area of the toy.

Ans: Radius, r = 3.5 cm
Total height of the toy = 15.5 cm
Height of the cone, h = 15.5 – 3.5 = 12 cm
Slant height of the cone, \( l = \sqrt{r^2 + h^2} = \sqrt{3.5^2 + 12^2} = 12.5 \text{ cm} \)
Total Surface Area of the toy = CSA of cone + CSA of hemisphere

\[ = \pi rl + 2\pi r^2 = \pi r(l + 2r) = \frac{22}{7} \times \frac{7}{2} (12.5 + 7) = 214.5 \text{ cm}^2 \]

40. Draw more than ogive for the following frequency distribution:

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<tr>
<th>Marks</th>
<th>0 – 10</th>
<th>10 – 20</th>
<th>20 – 30</th>
<th>30 – 40</th>
<th>40 – 50</th>
<th>50 – 60</th>
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<tbody>
<tr>
<td>Number of students</td>
<td>5</td>
<td>8</td>
<td>6</td>
<td>10</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

Also find the median from the graph.

Ans: More than cumulative frequency distribution

<table>
<thead>
<tr>
<th>Marks</th>
<th>Number of students</th>
</tr>
</thead>
<tbody>
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<td>More than or equal to 0</td>
<td>41</td>
</tr>
<tr>
<td>More than or equal to 10</td>
<td>36</td>
</tr>
<tr>
<td>More than or equal to 20</td>
<td>28</td>
</tr>
<tr>
<td>More than or equal to 30</td>
<td>22</td>
</tr>
<tr>
<td>More than or equal to 40</td>
<td>12</td>
</tr>
<tr>
<td>More than or equal to 50</td>
<td>6</td>
</tr>
</tbody>
</table>
n = 41 \Rightarrow n/2 = 20.5
From the graph, median = 31.8 approximately