

Roll No. : \_\_\_\_\_

Please check that this question paper contains 38 questions and 07 printed pages.

**D.A.V. INSTITUTIONS, CHHATTISGARH  
PRACTICE PAPER 1  
CLASS: X  
SUBJECT: MATHEMATICS (BASIC)**

TIME: 3 HOURS

MAX MARKS: 80

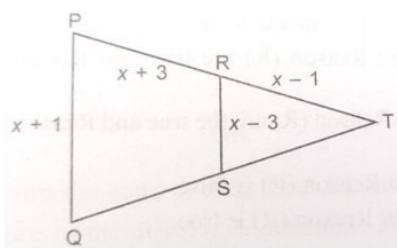
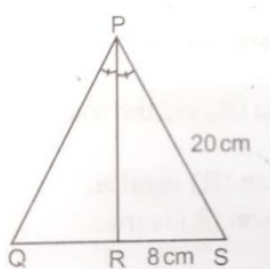
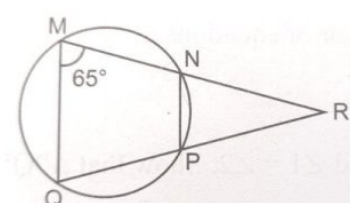
**General Instructions:**

1. This Question Paper has 5 sections A – 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 (04 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 of 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  $\pi = \frac{22}{7}$  wherever required if not stated.

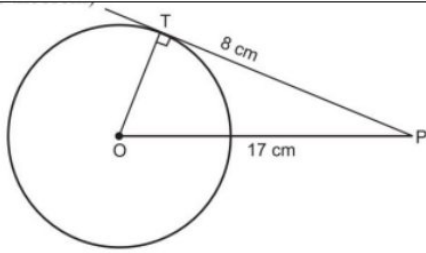
**SECTION A**

Section A consists of 20 questions of 1 mark each.

| Q. No. |  | Marks |
|--------|--|-------|
| 1      | What will be the least possible number of planks if three pieces of timber 42 m, 49 m and 63 m long have to be divided into planks of the same length?<br>(a) 5 (b) 6 (c) 7 (d) none of these      | 1     |
| 2      | If $p(x)$ is a polynomial of at least degree one and $p(k)=0$ , then $k$ is known as<br>(a) value of $p(x)$ (b) zero of $p(x)$ (c) constant term of $p(x)$ (d) none of these                       | 1     |
| 3      | What is the greatest possible speed at which a man can walk 52 km and 91 km in an exact number of minutes?<br>(a) 17 m/min (b) 7 m/min (c) 13 m/min (d) 26 m/min                                   | 1     |
| 4      | The zeroes of the quadratic polynomial $x^2+kx+k$ , $k \neq 0$ .<br>(a) both cannot be positive (b) both cannot be negative<br>(c) are always unequal (d) are always equal                         | 1     |
| 5      | The points $(-4, 0)$ , $(4, 0)$ and $(0, 3)$ are the vertices of a/an<br>(a) right triangle (b) isosceles triangle (c) equilateral triangle (d) scalene triangle                                   | 1     |
| 6      | Three alarm clocks ring their alarms at regular intervals of 20 min, 25 min and 30 min respectively. If they first beep together at 12 noon, at what time will they beep again for the first time? | 1     |

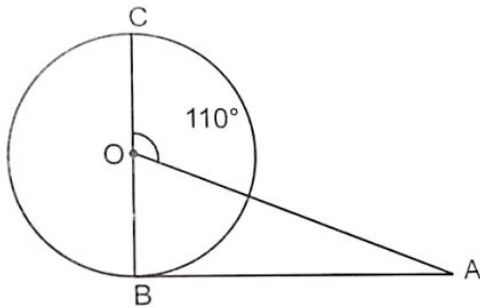
|    |   |   |
|----|---|---|
|    | (a) 4:00 pm                      (b) 4:30 pm                      (c) 5:00 pm                      (d) 5:30 pm  |   |
| 7  | $(1+\tan^2\theta)$ is equal to<br>(a) $\sin^2\theta$ (b) $\cos^2\theta$ (c) $\sec^2\theta$ (d) $\cot^2\theta$   | 1 |
| 8  | If $\tan \theta = \frac{a}{b}$ , then the value of $\frac{a \sin \theta + b \cos \theta}{a \sin \theta - \cos \theta}$<br>(a) $\frac{a^2-b^2}{a^2+b^2}$ (b) $\frac{a^2+b^2}{a^2-b^2}$ (c) $\frac{a}{a^2+b^2}$ (d) $\frac{b}{a^2+b^2}$   | 1 |
| 9  | Find the value of x for which $PQ \parallel RS$ in figure.<br><br>(a) 3                      (b) 4                      (c) 5                      (d) 6   | 1 |
| 10 | In the figure, $PQ=20$ cm. $\angle QPR = \angle SPR$ , then QR is equal to<br><br>(a) 6 cm                      (b) 8 cm                      (c) 10 cm                      (d) 12 cm   | 1 |
| 11 | In the figure shown, $MN=QP$ and on producing $MN$ and $QP$ , intersect at R. Also, $MQ \parallel NP$ . If $\angle NMQ = 65^\circ$ , then $\angle R$ is equal to<br><br>(a) $50^\circ$ (b) $65^\circ$ (c) $130^\circ$ (d) $44^\circ$ | 1 |
| 12 | If the ratio of the areas of two circles is 16:25 then the ratio of their circumferences is<br>(a) 4:5                      (b) 3:5                      (c) 5:4                      (d) 25:16   | 1 |
| 13 | Metallic spheres of radii 6 cm, 8 cm, and 10 cm, respectively, are melted to form a single solid sphere. The radius of the resulting sphere is.   | 1 |

|   |   |   |
|---|---|---|
|   | (a) 10 cm                      (b) 11 cm                      (c) 12 cm                      (d) 13 cm  |   |
| 14  | The Arithmetic mean of a set of 50 numbers is 38. If two numbers of the set namely 55 and 45 are discarded, the Arithmetic mean of the remaining set of numbers is.<br>(a) 40.9                      (b) 38.6                      (c) 37.5                      (d) 35.4   | 1 |
| 15  | The ratio between the volumes of two spheres is 8:27. The ratio of their surface areas is<br>(a) 2:3                      (b) 4:5                      (c) 5:6                      (d) 4:9   | 1 |
| 16  | The class mark of class interval 10 – 25 is.<br>(a) 14.3                      (b) 16.7                      (c) 17.5                      (d) 20.9  | 1 |
| 17  | If $\tan \theta = \frac{a}{x}$ then $\sec \theta = ?$<br>(a) $\frac{x}{a^2+x^2}$ (b) $\frac{\sqrt{x^2+a^2}}{x}$ (c) $\frac{\sqrt{x^2-a^2}}{x}$ (d) $\frac{x}{\sqrt{x^2+a^2}}$   | 1 |
| 18  | A fair dice is rolled. Probability of getting a prime number is<br>(a) 0                      (b) 1                      (c) $\frac{1}{2}$ (d) $\frac{1}{3}$  | 1 |
| 19  | <b>Assertion (A):</b> The point (0, 6) lies on y-axis.<br><b>Reason (R):</b> The x co-ordinate of the point on y-axis is zero.<br>a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).<br>b) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A).<br>c) Assertion (A) is true but Reason (R) is false.<br>d) Assertion (A) is false but Reason (R) is true.  | 1 |
| 20  | <b>Assertion (A):</b> $(3 \times 3 \times 2 \times 2 + 7)$ is a prime number.<br><b>Reason (R):</b> A number having more than 2 factors is called a composite number.<br>a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).<br>b) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation of Assertion (A).<br>c) Assertion (A) is true but Reason (R) is false.<br>d) Assertion (A) is false but Reason (R) is true. | 1 |
| <b>SECTION B</b>  |   |   |
| <b>Section B consists of 5 questions of 2 marks each.</b> |   |   |
| 21  | For which values of p. does the pair of equations given below have unique solution?<br>$4x+py +8= 0$<br>$2x+2y+2=0$   | 2 |
| 22  | Find the radius of the given circle.  | 2 |



OR

Find  $\angle OAB$  in the given figure.



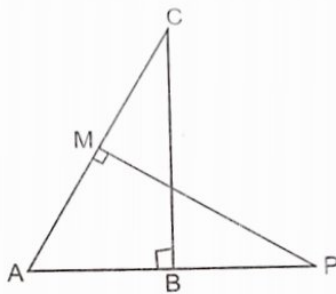
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| 23 | Find the area of a sector of a circle, when the radius of the circle is 21 cm and angle of the sector is $60^\circ$ . | 2 |
|----|---|---|

|    |  |   |
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| 24 | Evaluate: $\cos^2 30^\circ + \sin^2 45^\circ - \frac{1}{3}\tan^2 60^\circ + \cos 90^\circ$ | 2 |
|----|--|---|

OR

If  $\tan \theta = \frac{a}{b}$ , then the value of  $\frac{a \sin \theta - \cos \theta}{a \sin \theta + b \cos \theta}$

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| 25 | In the given figure prove that : $\Delta ABC \sim \Delta AMP$ | 2 |
|----|---|---|



**SECTION C**

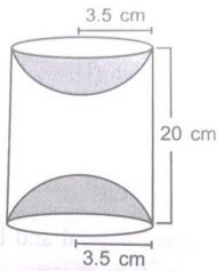
**Section C consists of 6 questions of 3 marks each.**

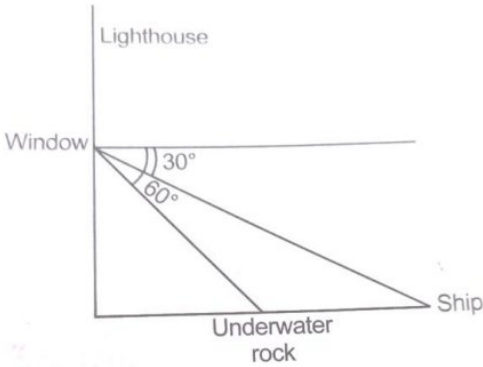
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| 26 | Show that $3\sqrt{3}$ is an irrational number whereas $\sqrt{3}$ is an irrational number. | 3 |
|----|---|---|

|    |   |   |
|----|---|---|
| 27 | The difference of an integer and its reciprocal is $\frac{143}{12}$ . Find the integer. | 3 |
|----|---|---|

OR

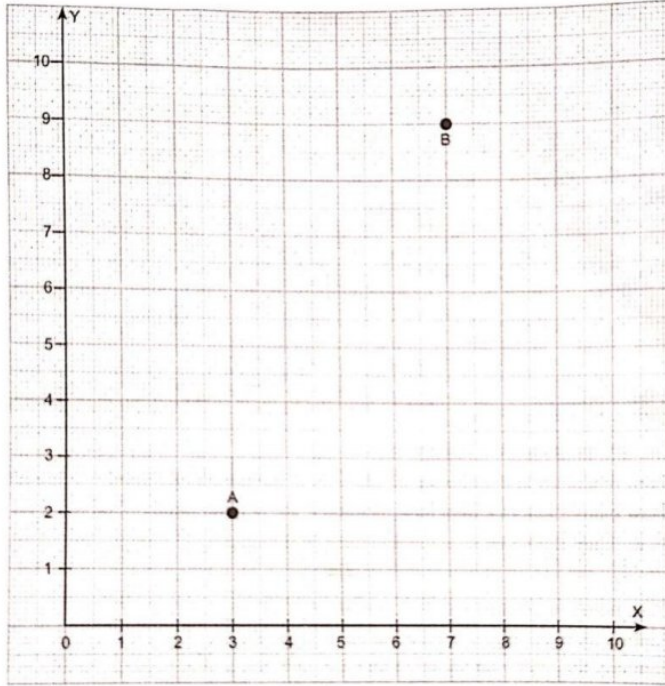
Find the positive value of k, for which the equation  $x^2 + kx + 64 = 0$  and  $x^2 - 8x + k = 0$  will

|   |   |   |
|---|---|---|
|   | both have real roots.   |   |
| 28  | If $\alpha$ and $\beta$ are zeroes of the quadratic polynomial $4x^2+4x+1$ , then form a quadratic polynomial whose zeroes are $2\alpha$ and $2\beta$ .   | 3 |
| 29  | If $\tan(A + B) = \sqrt{3}$ and $\tan(A - B) = \frac{1}{\sqrt{3}}$ , $0^\circ < A+B < 90^\circ$ ; $A > B$ , find A and B.   | 3 |
| 30  | The lengths of tangents drawn from an external point (point outside the circle) to a circle are equal. Prove it.<br><br>OR<br>ABC is an isosceles triangle, in which $AB=AC$ , circumscribed about a circle. Show that BC is bisected at the point of contact.  | 3 |
| 31  | One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting.<br>(i) a king of red colour                      (ii) a face card                      (iii) the queen of diamond   | 3 |
| <b>SECTION D</b>  |   |   |
| <b>Section D consists of 4 questions of 5 marks each.</b> |   |   |
| 32  | A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train.<br><br>OR<br>The difference of two numbers is 5 and the difference of their reciprocals is $\frac{1}{10}$ . Find the numbers.  | 5 |
| 33  | Diagonals AC and BD of a trapezium ABCD with $AB \parallel DC$ intersect each other at point O.<br>Using a similarity criterion for two triangles, show that $\frac{OA}{OC} = \frac{OB}{OD}$  | 5 |
| 34  | A solid is in the form of a right circular cylinder mounted on a solid hemisphere of radius 14 cm. The radius of the base of the cylindrical part is 14 cm and the vertical height of the complete solid is 28 cm. Find the volume of the solid.<br><br>OR<br>Carpenter made a wooden article by scooping out a hemisphere from each end of a solid cylinder as shown in figure:<br><br><br><br>If the height of the cylinder is 20 cm and radius of the base is 3.5 cm, find the total surface area of the article. | 5 |

|  |  |                            |         |         |         |         |         |         |           |    |    |    |    |    |    |   |
|--|--|----------------------------|---------|---------|---------|---------|---------|---------|-----------|----|----|----|----|----|----|---|
| 35   | <p>Find the mean of the given data.</p> <table border="1" data-bbox="164 293 1366 405"> <tr> <td>Class interval</td> <td>100-150</td> <td>150-200</td> <td>200-250</td> <td>250-300</td> <td>300-350</td> <td>350-400</td> </tr> <tr> <td>Frequency</td> <td>45</td> <td>67</td> <td>25</td> <td>35</td> <td>50</td> <td>58</td> </tr> </table>  | Class interval             | 100-150 | 150-200 | 200-250 | 250-300 | 300-350 | 350-400 | Frequency | 45 | 67 | 25 | 35 | 50 | 58 | 5 |
| Class interval   | 100-150  | 150-200                    | 200-250 | 250-300 | 300-350 | 350-400 |         |         |           |    |    |    |    |    |    |   |
| Frequency  | 45   | 67                         | 25      | 35      | 50      | 58      |         |         |           |    |    |    |    |    |    |   |
| <p><b>SECTION E</b></p> <p><b>Section E consists of 3 questions of 4 marks each.</b></p> |  |                            |         |         |         |         |         |         |           |    |    |    |    |    |    |   |
| 36   | <p>A leading LED TV manufacturing company manufactures 18000 LED TVs in the second year and 19800 LED TVs in tenth year. If the company increases the manufacturing of LED TV uniformly every year by fixed numbers.</p> <p>Based on the above information answer the following:</p> <p>(i) How much, the manufacturing of LED TV is increased every year?</p> <p>(ii) How many LED TVs were manufactured in the seventh year?</p> <p>(iii) How many LED TVs were manufactured in ten years?</p> <p style="text-align: center;">OR</p> <p>If the company is 12 years old, find number of LED TVs produced in last 3 years.</p>   | <p>1</p> <p>1</p> <p>2</p> |         |         |         |         |         |         |           |    |    |    |    |    |    |   |
| 37   | <p>A lighthouse 1000 feet high is situated at the edge of the sea. From the window at the middle of the lighthouse, the guard can see an underwater rock and a ship making the angles of depression <math>60^\circ</math> and <math>30^\circ</math> respectively. The ship is behind the underwater rock exactly and come towards it in a straight line.</p>  <p>Based on the above information, answer the following:</p> <p>(i) Find the distance between underwater rock and base of lighthouse.</p> <p>(ii) Find the distance between ship and underwater rock.</p> <p>(iii) If the speed of ship is 3 feet/s, then find the time taken by ship to collide with underwater rock.</p> <p style="text-align: center;">OR</p> <p>Find the initial distance between guard and ship.</p> | <p>1</p> <p>1</p> <p>2</p> |         |         |         |         |         |         |           |    |    |    |    |    |    |   |

38

On the occasion of children's day in a school, sports are organised. Kavita and Pooja are standing at points A and B whose positions are shown in the figure. Jitendra fixes the country flag at the mid- point (M) of the line joining the points A and B.



Based on the above information, answer the following:

- (i) Find distance between Kavita and Pooja.
- (ii) Find the coordinates of flag (M).
- (iii) If the position of flag M divides AB internally in the ratio of 2: 1, then where is the flag posted

OR

Find the distance of both Kavita and Pooja from the origin.

1  
1  
2