

**Class - X**  
**Mathematics-Basic (241)**  
**Sample Question Paper 2019-20**

**Max. Marks: 80**

**Duration: 3 hrs.**

**General Instructions:**

- a) All questions are compulsory
- b) The question paper consists of 40 questions divided into four sections A, B, C & D.
- c) 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 6 questions of 4 marks each.
- d) There is no overall choice. However internal choices have 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.
- e) Use of calculators is not permitted.

**SECTION - A**

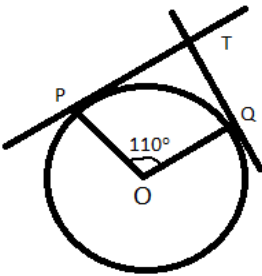
**Q 1- 10 are multiple choice questions. Select the most appropriate answer from the given options.**

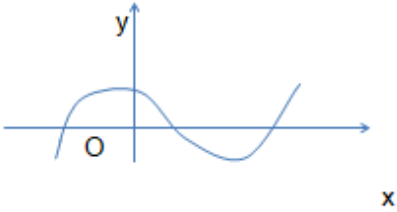
<b>1.</b>	HCF of 168 and 126 is  (a) 21                      (b) 42                      (c) 14                      (d) 18	<b>1</b>
<b>2.</b>	Empirical relationship between the three measures of central tendency is	<b>1</b>

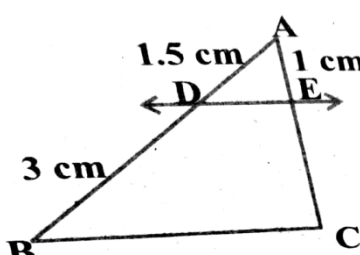
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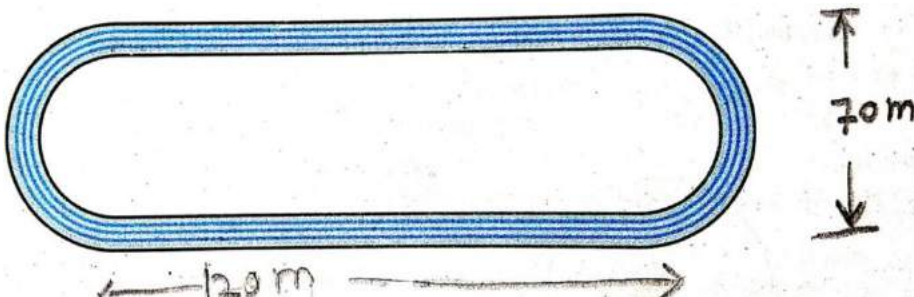


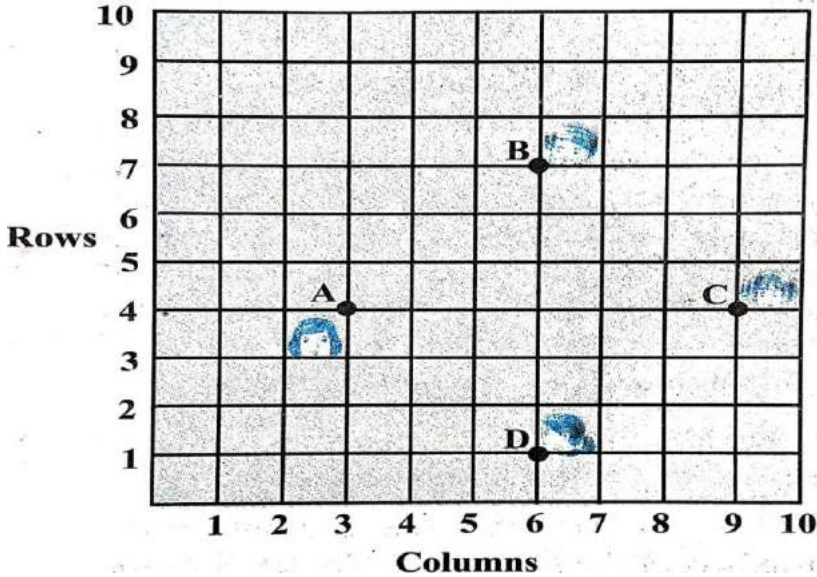
	<p>(a) 2 Mean = 3 Median - Mode Median - Mean</p> <p>(c) Mode = 2 Mean - 3 Median Mode + Mean</p>	<p>(b) 2 Mode = 3</p> <p>(d) 3 Median = 2</p>	
3.	<p>In the given figure, if TP and TQ are tangents to a circle with centre O, so that <math>\angle POQ = 110^\circ</math>, then <math>\angle PTQ</math> is</p>		1
	<p>(a) <math>110^\circ</math></p> <p>(c) <math>80^\circ</math></p>	<p>(b) <math>90^\circ</math></p> <p>(d) <math>70^\circ</math></p>	
4.	<p>325 can be expressed as a product of its primes as</p>		1
	<p>(a) <math>5^2 \times 7</math></p> <p>(c) <math>5 \times 13^2</math></p>	<p>(b) <math>5^2 \times 13</math></p> <p>(d) <math>2 \times 3^2 \times 5^2</math></p>	
5.	<p>One card is drawn from a well shuffled deck of 52 cards. The probability that it is black queen is</p>		1
	<p>(a) <math>\frac{1}{26}</math></p>	<p>(b) <math>\frac{1}{13}</math></p> <p>(c) <math>\frac{1}{52}</math></p> <p>(d) <math>\frac{2}{13}</math></p>	
6.	<p>The sum of the zeroes of the polynomial <math>2x^2 - 8x + 6</math> is</p>		1
	<p>(a) - 3</p> <p>(d) 4</p>	<p>(b) 3</p> <p>(c) - 4</p>	
7.	<p>Which of the following is the decimal expansion of an irrational number</p>		1
	<p>(a) 4.561</p> <p>(b) <math>0.\overline{12}</math></p>	<p>(c) 5.010010001...</p> <p>(d) 6.03</p>	

8.	<p>The following figure shows the graph of <math>y = p(x)</math>, where <math>p(x)</math> is a polynomial in variable <math>x</math>. The number of zeroes of the polynomial <math>p(x)</math> is</p> <p>(a) 1                      (b) 2                      (c) 3                      (d) 4</p> 	1
9.	<p>The distance of the point P (3, - 4) from the origin is</p> <p>(a) 7 units                      (b) 5 units                      (c) 4 units (d) 3 units</p>	1
10.	<p>The mid point of the line segment joining the points (- 5, 7) and (- 1, 3) is</p> <p>(a) (-3, 7)                      (b) (-3, 5)                      (c) (-1, 5) (d) (5, -3)</p>	1
<b>(11 - 15) Fill in the blanks:</b>		
11.	<p>The point which divides the line segment joining the points A (0, 5) and B (5, 0) internally in the ratio 2:3 is _____</p>	1
12.	<p>The pair of lines represented by the equations <math>2x+y+3 = 0</math> and <math>4x+ky+6 = 0</math> will be parallel if value of <math>k</math> is _____.</p> <p style="text-align: center;"><b>OR</b></p> <p>If the quadratic equation <math>x^2 - 2x + k = 0</math> has equal roots, then value of <math>k</math></p>	1

	is _____.	
13.	The value of $\sin 60^\circ \cos 30^\circ + \sin 30^\circ \cos 60^\circ$ is_____.	1
14.	Value of $\cos 0^\circ \cdot \cos 30^\circ \cdot \cos 45^\circ \cdot \cos 60^\circ \cdot \cos 90^\circ$ is _____.	1
15.	The sides of two similar triangles are in the ratio 2:3, then the areas of these triangles are in the ratio _____	
<b>(16 - 20) Answer the following :</b>		
16.	<p><math>\triangle PQR</math> is right angled isosceles triangle, right angled at R. Find value of <math>\sin P</math>.</p> <p style="text-align: center;"><b>OR</b></p> <p>If <math>15 \cot A = 8</math>, then find value of <math>\operatorname{cosec} A</math>.</p>	1
17.	If area of quadrant of a circle is $38.5 \text{ cm}^2$ then find its diameter (use $\pi = \frac{22}{7}$ )	1
18.	A dice is thrown once. Find the probability of getting a prime number.	1
19.	In the given fig. If $DE \parallel BC$ Find EC.	1
		

20.	Find the common difference of the A.P whose first term is 12 and fifth term is 0.	1								
	<b><u>SECTION - B</u></b>									
21.	If two coins are tossed simultaneously. Find the probability of getting 2 heads.	2								
22.	A lot of 25 bulbs contain 5 defective ones. One bulb is drawn at random from the lot. What is the probability that the bulb is good.  <b>OR</b> Two dice are thrown simultaneously at random. Find the probability of getting a sum of eight.	2								
23.	Prove that the tangents drawn at the ends of a diameter of a circle are parallel.	2								
24.	Show that $\tan 48^\circ \tan 23^\circ \tan 42^\circ \tan 67^\circ = 1$ .  <b>OR</b> Evaluate $\cos 48^\circ \cos 42^\circ - \sin 48^\circ \sin 42^\circ$	2								
25.	Find the area of circle whose circumference is 22cm.	2								
26	Read the following passage and answer the questions that follows: A teacher told 10 students to write a polynomial on the black board. Students wrote <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">1. <math>x^2 + 2</math></td> <td style="width: 50%;">6. <math>x - 3</math></td> </tr> <tr> <td>2. <math>2x + 3</math></td> <td>7. <math>x^4 + x^2 + 1</math></td> </tr> <tr> <td>3. <math>x^3 + x^2 + 1</math></td> <td>8. <math>x^2 + 2x + 1</math></td> </tr> <tr> <td>4. <math>x^3 + 2x^2 + 1</math></td> <td>9. <math>2x^3 - x^2</math></td> </tr> </table>	1. $x^2 + 2$	6. $x - 3$	2. $2x + 3$	7. $x^4 + x^2 + 1$	3. $x^3 + x^2 + 1$	8. $x^2 + 2x + 1$	4. $x^3 + 2x^2 + 1$	9. $2x^3 - x^2$	2
1. $x^2 + 2$	6. $x - 3$									
2. $2x + 3$	7. $x^4 + x^2 + 1$									
3. $x^3 + x^2 + 1$	8. $x^2 + 2x + 1$									
4. $x^3 + 2x^2 + 1$	9. $2x^3 - x^2$									

	5. $x^2 - 2x + 1$	10. $x^4 - 1$	
	(i) How many students wrote cubic polynomial (ii) Divide the polynomial $(x^2 + 2x + 1)$ by $(x + 1)$ .		
	<b><u>SECTION C</u></b>		
27.	Find the zeroes of the quadratic polynomial $x^2 - 3x - 10$ and verify the relationship between the zeroes and coefficient.		3
28.	Draw a circle of radius 4 cm. From the point 7 cm away from its centre, construct the pair of tangents to the circle.  <b>OR</b>  Draw a line segment of length 8 cm and divide it in the ratio 2:3		3
29.	<p>Following figure depicts a park where two opposite sides are parallel and left and right ends are semi-circular in shape. It has a 7m wide track for walking</p>  <p>Two friends Seema and Meena went to the park. Meena said that area of the track is <math>4066\text{m}^2</math>. Is she right? Explain.</p>		3
30.	<p>Prove that <math>\frac{\cot A - \cos A}{\cot A + \cos A} = \frac{\operatorname{cosec} A - 1}{\operatorname{cosec} A + 1}</math></p> <p style="text-align: center;"><b>OR</b></p> <p>Prove that: <math>\frac{\tan A + \sin A}{\tan A - \sin A} = \frac{\sec A + 1}{\sec A - 1}</math></p>		3

31.	<p>Prove that <math>5 - \sqrt{3}</math> is irrational, given that <math>\sqrt{3}</math> is irrational.</p> <p style="text-align: center;"><b>OR</b></p> <p>An army contingent of 616 members is to march behind an army band of 32 members in a parade. The two groups are to march in the same number of columns. What is the maximum number of columns in which they can march ?</p>	3
32.	<p>Prove that the lengths of tangents drawn from an external point to a circle are equal.</p>	3
33.	<p>Read the following passage and answer the questions that follows:          In a class room, four students Sita, Gita, Rita and Anita are sitting at A(3,4), B(6,7), C(9,4), D(6,1) respectively. Then a new student Anjali joins the class</p> <div style="text-align: center;">  </div>	3
	(i) Teacher tells Anjali to sit in the middle of the four students. Find the coordinates of the position where she can sit.	1
	(ii) Calculate the distance between Sita and Anita.	1
	(iii) Which two students are equidistant from Gita.	1

34.	Solve $2x + 3y = 11$ and $x - 2y = -12$ algebraically and hence find the value of 'm' for which $y = mx + 3$ .	3
	<b><u>SECTION D</u></b>	
35.	Find two consecutive positive integers sum of whose squares is 365.	4
36.	If the sum of first 14 terms of an A.P. is 1050 and its first term is 10, find the 20 <sup>th</sup> term.  <b>OR</b>  The first term of an A.P. is 5, the last term is 45 and sum is 400. Find the number of terms and the common difference.	4
37.	As observed from the top of a 75m high light house above the sea level, the angles of depression of two ships are $30^\circ$ and $45^\circ$ respectively. If one ship is exactly behind the other on the same side of the light house and in the same straight line, find the distance between the two ships. (use $\sqrt{3} = 1.732$ )	4
38.	If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then prove that the other two sides are divided in the same ratio.  <b>OR</b>  State and prove the Pythagoras theorem.	4
39.	A copper rod of diameter 1 cm and length 8 cm is drawn in to a wire of length 18 m of uniform thickness. Find the thickness of wire.  <b>Or</b>	4



	A metallic sphere of radius 4.2 cm is melted and recast into the shape of a cylinder of radius 6 cm. Find the height of the cylinder.													
<b>40.</b>	<p>The following distribution gives the daily income of 50 workers of a factory</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td><b>Daily income</b></td> <td><b>400-420</b></td> <td><b>420-440</b></td> <td><b>440-460</b></td> <td><b>460-480</b></td> <td><b>480-500</b></td> </tr> <tr> <td><b>Number of workers</b></td> <td><b>12</b></td> <td><b>14</b></td> <td><b>8</b></td> <td><b>6</b></td> <td><b>10</b></td> </tr> </table> <p>Convert this distribution to less than type of cumulative frequency distribution and draw its ogive.</p>	<b>Daily income</b>	<b>400-420</b>	<b>420-440</b>	<b>440-460</b>	<b>460-480</b>	<b>480-500</b>	<b>Number of workers</b>	<b>12</b>	<b>14</b>	<b>8</b>	<b>6</b>	<b>10</b>	<b>4</b>
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