

Class X Mathematics –Standard (041)
Sample Question Paper 2 2019-20

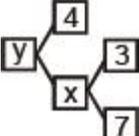
Max. Marks: 80

Duration : 3 hrs

General Instructions:

- (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.

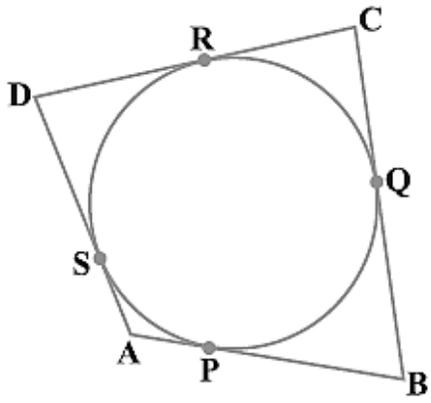
SECTION A		
Q 1- Q 10 are multiple choice questions. Select the most appropriate answer from the given options.		
1	The decimal expansion of $441/(2^2 \times 5^3 \times 7)$ has a) Terminating decimal b) Non terminating but repeating c) Non terminating but non repeating d) Terminating after two decimal place.	1

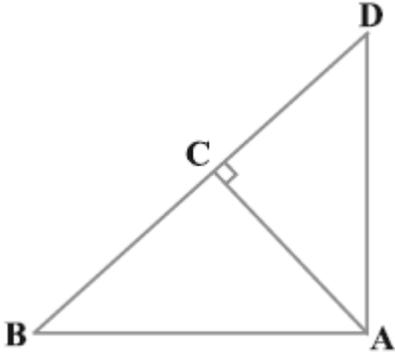
2	<p>Construction of a cumulative frequency table is useful in determining the</p> <p>a) mode b) median c) mean d) average</p>	1
3	<p>The values of x and y in the given figure down are:</p> <p>a) 10,14 b) 21,84 c) 21,25 d) 10,40</p> 	1
4	<p>For which value(s) of p, will the lines represented by the following pair of linear equations be parallel</p> $3x - y - 5 = 0$ $6x - py - 7 = 0$ <p>a) all real values except 10 b) 10 c) 5/2 d) 2</p>	1

5	<p>If triangle ABC is right angled at C, then the value of $\tan (A+B)$ is</p> <p>a) 0 b) 1 c) $\frac{2}{\sqrt{3}}$ d) not defined</p>	1
6	<p>If $\sin 8 + \cos 8 = \sqrt{2}\sin 8$, ($8 \neq 90^\circ$) then the value of $\tan 8$ is</p> <p>a) $\sqrt{2} - 1$ b) $\sqrt{2} + 1$ c) $\sqrt{2}$ d) $-\sqrt{2}$</p>	1
7	<p>Given that $\tan \alpha = \sqrt{3}$ and $\cos \beta = 0$, then the value of $\beta - \alpha$ is</p> <p>a) 0° b) 90° c) 60° d) 30°</p>	1
8	<p>The point which divides the line segment joining the points $(1, -9)$ and $(4, -3)$ in ratio 1 : 2 internally lies in the</p> <p>a) I quadrant b) II quadrant c) III quadrant d) IV quadrant</p>	1
9	<p>The distance of the point P $(-3, -5)$ from the y-axis (in units) is</p> <p>a) 3 b) -3 c) 4 d) 5</p>	1

10	<p>If $A\left(\frac{n}{3}, 8\right)$ is the mid-point of the line segment joining the points $Q(-10, 4)$ and $R(-8, 12)$, then the value of n is</p> <p>a) -12 b) -4 c) -27 d) -6</p>	1
(Q 11- Q 15) Fill in the blanks		
11	<p>The total volume of the given solid figure is _____</p> <div data-bbox="634 604 963 957" data-label="Image"> <p>The diagram shows a composite solid figure. It consists of a cone on top of a cylinder. The cone's radius is labeled 'r' and its slant height is labeled 'l'. The cylinder's height is labeled 'h'.</p> </div>	1
12	<p>If one root of the equation $(k - 1)x^2 - 10x + 3 = 0$ is twice the reciprocal of the other, then the value of k is</p>	1
13	<p>The perimeters of two similar triangles $\triangle ABC$ and $\triangle PQR$ are 35cm and 45cm respectively, if length of $AB = 7$cm then length of PQ is</p>	1

14	30th term of AP: 10,7,4, Is	1
15	A number is chosen at random from the numbers -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5. Then the probability that square of this number is greater than or equal to 16 is	1
(Q 16- Q 20) Answer the following		
16	Given that $HCF(306,657) = 9$, find $LCM(306,657)$	1
17	In the $\triangle ABC$, if $AB = 6\sqrt{3}$ cm, $AC = 12$ cm and $BC = 6$ cm, then find the $\angle B$	1
18	If tangents PA and PB from a point P to a circle with centre O are inclined to each other at angle of 80, then $\angle POA$ is equal to _____ OR The length of tangent from a point A at distance 13cm from centre of circle is 12cm. Find the diameter of circle.	1
19	Find missing terms of AP -4, _____, _____, _____, _____, 6	1
20	Find the value(s) of k for which the quadratic equation $x^2 + 2\sqrt{2}kx + 16 = 0$ has real and distinct roots	1
Section – B		
21	Which term of the AP: 2,8,18,.....is 78?	2
22	A quadrilateral ABCD is drawn to circumscribe a circle. Prove that: $AB+CD=AD+BC$	2



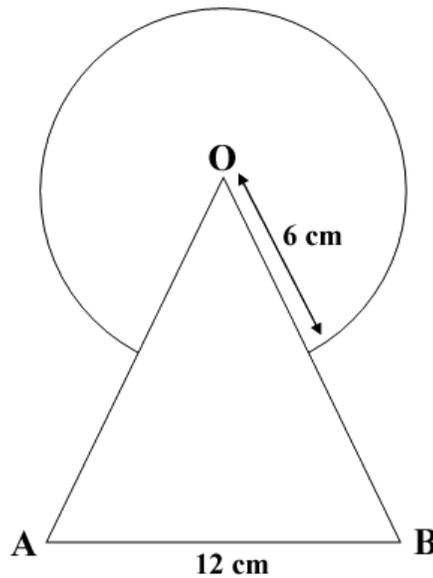
23	<p>In the given figure, ABD is a triangle right angled at A and $AC \perp BD$. Show that (i) $AB^2 = BC \cdot BD$</p>  <p style="text-align: center;">OR</p> <p>In an equilateral triangle, prove that three times the square of one side is equal to four times the square of one of its altitudes.</p>	2
24	<p>The angles of depression of the top and the bottom of an 8 m tall building from the top of a multi-storeyed building are 30° and 45°, respectively. Find the height of the multi-storeyed building and the distance between the two buildings.</p>	2
25	<p>One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting?</p> <p>i) The jack of hearts ii) A spade?</p> <p style="text-align: center;">OR</p> <p>A bag contains tickets, numbered 11, 12, 13, ..., 30. A ticket is taken out from the bag at random. Find the probability that the number on the drawn ticket (i) is a multiple of 7 (ii) is greater than 15 and a multiple of 5.</p>	2

26	<p>A toy is in the form of a cone mounted on a hemisphere of common base radius 7 cm. The total height of the toy is 31 cm. Find the total surface area of the toy.</p> <p>[Take $\pi = \frac{22}{7}$]</p>	2
Section C		
27	<p>Given that $\sqrt{3}$ is irrational, prove that $2\sqrt{3} - 3$ is an irrational number.</p> <p style="text-align: center;">OR</p> <p>If HCF of 144 and 180 is expressed in the form $13m-16$. Find the value of m.</p>	3

28	The mth term of an A.P. is n and the nth term is m. Find the rth term of the A.P.	3
29	In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the other two sides. Prove it.	3
30	If α and β are the zeroes of a quadratic polynomial $x^2 + x - 2$ then find the value of $\left(\frac{1}{\alpha} - \frac{1}{\beta}\right)$.	3
31	If vertices of a triangles are (1, k), (4, -3) and (-9, 7) and its area is 15 sq. units then find then the value of k.	3
32	Prove that following identity, where the angle involved is acute angle. $\frac{\cos A - \sin A + 1}{\cos A + \sin A - 1} = \operatorname{cosec} A + \cot A$	3

33

3



Find the area of the shaded region in Fig. above, where a circular arc of radius 6 cm has been drawn with vertex O of an equilateral triangle OAB of side 12 cm as centre. Use $\pi = \frac{22}{7}$

34

3

The mode of the following frequency distribution is 55. Find the value of p and q.

Class Interval	0-15	15-30	30-45	45-60	60-75	75-90	Total
Frequency	6	7	p	15	10	q	51

Section – D

35 Draw an equilateral triangle of height 3.6 cm. Draw another triangle similar to it such that its side is 3 times of the side of the first.

4

OR

Construct a pair of tangents to a circle of radius 4 cm which are inclined to each other at an angle of 60°

36	State and prove basic proportionality theorem.	4												
37	<p>A man travels 600km apart by train and partly by car. It takes 8 hours and 40 minutes if he travels 320 km by train and rest by car. It would take 30 minutes more if he travels 200 km by train and the rest by the car. Find the speed of the train and by car separately.</p> <p style="text-align: center;">OR</p> <p>4 men and 6 boys can finish a piece of work in 5 days while 3 men and 4 boys can finish it in 7 days. Find the time taken by 1 man alone and 1 boy alone.</p>	4												
38	<p>Three cubes of a metal whose edges are in the ratio 3 : 4 : 5 are melted and converted into a single cube whose diagonal is $12\sqrt{3}$ cm. Find the edges of the three cubes.</p> <p style="text-align: center;">OR</p> <p>Water is flowing at the rate of 15km/hour through a pipe of diameter 14cm into a cuboidal pond which is 50m long and 44m wide. In what time will the level of water in the pond rise by 21cm?</p>	4												
39	The angles of elevation of the top of a tower from two points at a distance of 4 m and 9 m from the base of the tower and in the same straight line with it are complementary. Prove that the height of the tower is 6 m.	4												
40	<p>The following table shows the ages of staff members in a office. Find mean and the mode</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Age</th> <th>18-27</th> <th>27-36</th> <th>36-45</th> <th>45-54</th> <th>54-63</th> </tr> </thead> <tbody> <tr> <td>Number of members</td> <td>6</td> <td>11</td> <td>21</td> <td>23</td> <td>14</td> </tr> </tbody> </table>	Age	18-27	27-36	36-45	45-54	54-63	Number of members	6	11	21	23	14	4
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