

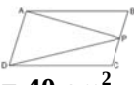


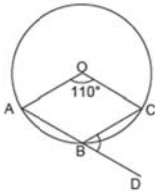
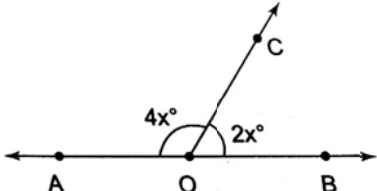
ITL PUBLIC SCHOOL ANNUAL EXAMINATION (2019-20)

Date: 28.02.20

Mathematics Answer Key – SET A

Class: IX

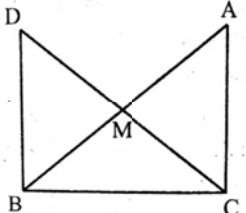
	SECTION – A	
	MULTIPLE CHOICE QUESTIONS <i>Select the correct option out of the four possible options given after the statement of the question:</i>	
1	The value of $(512)^{-\frac{2}{9}}$ is: (a) $\frac{1}{4}$ (b) $\frac{1}{8}$ (c) $\frac{1}{2}$ (d) $\frac{1}{512^{\frac{2}{9}}}$ (a)	1
2	A chord is at a distance of 8cm from the centre of a circle of radius 17 cm . The length of the chord is: (a) 25 cm (b) 12.5 cm (c) 30 cm (d) 9 cm (c)	1
3	The zeroes of the polynomial $x(x - 1)(x + 2)$ are: (a) 0, -1, -2 (b) 0, 1, -2 (c) 0, -1, 2 (d) 0, 1, 2 (b)	1
4	The perimeter of equilateral triangle is 60 m. The area is: (a) $10\sqrt{3} \text{ m}^2$ (b) $15\sqrt{3} \text{ m}^2$ (c) $20\sqrt{3} \text{ m}^2$ (d) $100\sqrt{3} \text{ m}^2$ (d)	1
5	If the total surface area of a sphere is 5544 cm^2 , then the diameter of a sphere is: (a) 21 cm (b) 42 cm (c) 10.5 cm (d) 63 cm (b)	1
6	If the coordinates of two points A and B are (10,5) and (-7, -4) respectively. Then the value of (abscissa of A – ordinate of B) is: (a) -14 (b) 14 (c) -10 (d) -12 (b)	
	FILL IN THE BLANKS <i>Complete the following statements with appropriate answer(s) in the blank space(s):</i>	1
7	The range of the data 14, 27, 29, 61, 45, 15, 9, 18 is <u>52</u> .	1
8	An exterior angle of a triangle is 110° and its two interior opposite angles are equal. Then, the measure of each of equal angle is <u>55</u> .	1
9	A diagonal of a parallelogram divides it into two <u>congruent</u> triangles. OR Diagonals of rhombus bisect each other at <u>right</u> angles.	1
10	The construction of a triangle is possible only if sum of two sides is <u>greater</u> than the third side.	1
11	The probability of choosing a vowel from the English alphabets is <u>5/26</u> .	1
	VERY SHORT ANSWER QUESTIONS <i>Each of the following questions have to be answered in one word or one sentence:</i>	
12	If area of parallelogram ABCD is 80 cm^2 , then find area($\triangle ADP$).  = 40 cm^2	1

13	In ΔABC $\angle A = 45^\circ$ and $\angle B = 70^\circ$, then name the smallest side of the triangle. BC	1
14	Write a binomial of degree 5. OR Find the value of $515^2 - 512^2$. $X^5 + 3$(any other) 3081	1
15	If O is the centre of the circle as shown in figure, find $\angle CBD$.  110°	1
16	Find the mean of first five prime numbers. 5.6	
17	Give the equation of a line passing through (3, 7). $X + y = 10$	1
	TRUE OR FALSE <i>State whether the following statements are true or false:</i>	
18	If four sides of a quadrilateral are equal, it is a parallelogram. True	1
19	$\sqrt{25}$ is an irrational number. False	1
20	The point of the form $(a, -a)$ always lie on the line $x + y = 0$. True	1
	SECTION – B	
21	A cuboidal water tank is 6 m long, 5 m wide and 4.5 m deep. How many litres of water can it hold? Volume = $6 \times 5 \times 4.5$(1) = 135000 litres(1)	2
22	In ΔABC , $\angle A + \angle B = 110^\circ$, $\angle C + \angle A = 135^\circ$. Find $\angle A$. OR In the given figure, if $\angle AOC$ and $\angle BOC$ form a linear pair then find the value of x.  $\angle A + \angle B + \angle C + \angle A = 245^\circ$(1) $180 + \angle A = 245^\circ$ $\angle A = 245^\circ - 180 = 65$(1) $4x + 2x = 180$(1) $6x = 180$ $X = 30$(1)	2
23	Construct an angle of measure 60° . Also, justify the construction. Construction(1) Justification(1)	2
24	Express $0.\overline{26}$ in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$. OR	2

	Represent $\sqrt{10}$ on the number line. Let $x = 0.262626\ldots(0.5)$ $100x = 26.26\ldots(0.5)$ $99x = 26\ldots(0.5)$ $X = 26/99\ldots(0.5)$ Contruotion of line segment $\ldots(0.5)$ Perpendicular at 3 units $\ldots(0.5)$ Const of $90^\circ\ldots(0.5)$ Final marking on number line $\ldots(0.5)$									
25	Prove that if chords of congruent circles subtend equal angles at their centres, then the chords are equal. Figure $\ldots(0.5)$ Correct proof $\ldots(1.5)$	2								
26	a) Factorise : $9x^2 - 12x + 4$ b) Expand $(3a - 2b)^3$ $(3x - 2)^2\ldots(1)$ $9a^2 + 4b^2 - 12ab\ldots(1)$	2								
SECTION – C										
27	The Sides of a triangle are in the ratio of 12:17:25 and its perimeter is 540 cm. Find its area. OR If the sides of a rhombus are 6 cm each and one diagonal is 8 cm. Find the height of the rhombus. $12x + 17x + 25x = 540$ $X = 10\ldots(0.5)$ $S = 270\ldots(0.5)$ $\text{Area} = \sqrt{270 \times 150 \times 100 \times 20}\ldots(0.5)$ $= 9000\ldots(1.5)$	3								
28	A part of monthly expenses of a family on milk is fixed as Rs. 500 and the remaining varies with the quantity of milk, taken extra at the rate of Rs. 20 per Kg. Taking the quantity of milk required as x kg and the total expenditure as Rs. y , write a linear equation for this information and draw its graph. According to question, $y = 500 + 20x\ldots(0.5)$ <table border="1"><tr><td>X</td><td>0</td><td>1</td><td>2</td></tr><tr><td>Y</td><td>500</td><td>520</td><td>540</td></tr></table> Plotting the points $\ldots(2)$ Format of graph $\ldots(0.5)$	X	0	1	2	Y	500	520	540	3
X	0	1	2							
Y	500	520	540							
29	Show that $(x - 2)$ is a factor of the polynomial $2x^3 - 3x^2 - 17x + 30$ and hence find its other factors also. OR Using a suitable identity factorize $p^3(q - r)^3 + q^3(r - p)^3 + r^3(p - q)^3$ $X = 2$ $P(2) = 16 - 12 - 34 + 30 = 46 - 46 = 0\ldots(0.5)$ $2x^3 - 3x^2 - 17x + 30$ divide by $(x - 2) = 2x^2 + x - 15\ldots(1.5)$ $2x^2 + x - 15 = (x - 2)(x + 3)\ldots(1)$	3								

30	The table shows the number of people visited the “Good living Pavilion” in a trade fair during different times of a day: <table><tr><th>Time</th><th>Number of People</th></tr><tr><td>9 am to 11 am</td><td>175</td></tr><tr><td>11 am to 1 pm</td><td>125</td></tr><tr><td>1 pm to 3 pm</td><td>225</td></tr><tr><td>3 pm to 5 pm</td><td>200</td></tr><tr><td>5 pm to 7 pm</td><td>120</td></tr></table> Find the probability that the randomly chosen person visited the pavilion a) after 9 am but before 1 pm = 300 /845.....(1) b) between 11 am and 3 pm = 350/845.....(1) after 3 pm = 320/845.....(1)	Time	Number of People	9 am to 11 am	175	11 am to 1 pm	125	1 pm to 3 pm	225	3 pm to 5 pm	200	5 pm to 7 pm	120	3
Time	Number of People													
9 am to 11 am	175													
11 am to 1 pm	125													
1 pm to 3 pm	225													
3 pm to 5 pm	200													
5 pm to 7 pm	120													
31	The points scored by a basketball team in a series of matches are as follows: 17, 2, 7, 27, 25, 5, 14, 18, 10, 24, 48, 10, 8, 7, 10, 28. Find the median and mode for the given data. Mode = 10(1) Ascending order = 2 ,5 , 7 , 7, 8, 10, 10, 10,14,17,18,24,25 , 27 , 28, 48 n= 16.....(0.5) Median = mean of 8 th and 9 th.....(0.5) = 10 +14= 24/2 = 12(1)	3												
32	The volume of a right circular cone is 9856 cm^3. If the diameter of the base is 28 cm, find a) height of the cone b) slant height of the cone c) curved surface area of the cone OR A dome of a building is in the form of a hemisphere. From inside, it was white washed at the cost of Rs. 498.96. If the cost of white washing is Rs.2 per square metre, find the a) inside surface area of the dome volume of the air inside the dome. Height = 48 cm.....(1) Slant height = 50 cm.....(1) Csa = 2200 cm^2.....(1) Surface area = 249.48.....(0.5) Radius = 6.3 cm.....(1.5) Volume = 523.90 cm^3.....(1)	3												
33	In the given figure, D is the mid-point of BC and L is the mid-point of AD. Prove that $\text{ar}(\triangle ABL) = \frac{1}{4}\text{ar}(\triangle ABC)$ Given: D is mid-point of BC and L is mid-point of AD.....(0.5) To prove: $\text{ar}(\triangle ABL) = \frac{1}{4}\text{ar}(\triangle ABC)$	3												

	Proof: We have $ar(ABC) = ar(ADC) + ar(ADB) \dots(i)$ But $ar(ADC) = ar(ADB) \dots(ii)$ (AD is median of ABC).....(0.5) From (i) and (ii), we have $ar(ABC) = 2ar(ADB) \dots(iii)$ Also, $ar(ABD) = ar(ABL) + ar(DBL) \dots(iv)$.....(0.5) From (iii) and (iv), we have $ar(ABC) = 2ar(ABL) + 2ar(DBL) \dots(v)$.....(0.5) But $ar(ABL) = ar(DBL) \dots(vi)$ (BL is median of ABD) From (v) and (vi), we have $ar(ABC) = 2ar(ABL) + 2ar(ABL)$.....(0.5)											
34	Plot the points A(0,0) , B (0 , 6) and C(5, 0) on graph paper and calculate the area of figure so obtained. Plotting the points.....(0.5)each Joining them.....(0.5) Area of the figure.....(1)	3										
SECTION – D												
35	The heights of 50 students measured to the nearest centimeters, have been found to be as follows: 161, 150, 154, 165, 168, 161, 154, 162, 150, 151, 162,164,171,165,158,154,156,172,160,170 153,159,161,170,162,165,166,168,165,164,154,152,153,156,158,162,160,161,173,166,161 159, 162,167,168,159,158,153,154,159 a) Represent the data given above by a grouped frequency distribution table, taking the class intervals as 160- 165, 165- 170 etc. b) Draw the histogram from the table so obtained. <table><tr><td>150 – 155</td><td>12</td></tr><tr><td>150 – 160</td><td>9</td></tr><tr><td>160 – 165</td><td>14</td></tr><tr><td>165 – 170</td><td>10</td></tr><tr><td>170 – 175</td><td>5</td></tr></table> Table ... (2) Graph(2)	150 – 155	12	150 – 160	9	160 – 165	14	165 – 170	10	170 – 175	5	4
150 – 155	12											
150 – 160	9											
160 – 165	14											
165 – 170	10											
170 – 175	5											
36	Construct a triangle ABC If, its perimeter is 10.4 cm and two angles are 45° and 120°. OR Construct a triangle ABC in which $BC = 8$ cm, $\angle B = 45^\circ$ and $AB - AC = 3.5$ cm. Construction of base.....(1) Construction of base angles.....(0.5)	4										

	Angle bisectors.....(0.5) Perpendicular bisectors.....(0.5) Final triangle.....(0.5) Or Construction of base.....(0.5) Construction of base angle.....(0.5) Sum of sides.....(0.5) Perpendicular bisector.....(1) Final triangle.....(0.5)	
37	A metal pipe is 77 cm long. The inner diameter of a cross- section is 4 cm, the outer diameter being 4.4 cm . Find the total surface area of the metal used. Inner radius = 2 cm.....(0.5) Outer radius = 2.2 cm.....(0.5) Total surface area = $2 \times 22/7 \times (4.2 \times 77 + (4.84 - 4))$(2) $= 44/7(323.40 + 0.84) = 44 \times 46.32 = 2038.08 \text{ cm}^2$.....(1)	4
38	In right triangle ABC, right angled at C, M is the mid-point of hypotenuse AB. C is joined to M and produced to a point D such that DM = CM. Point D is joined to point B. Show that: (i) $\Delta AMC \cong \Delta BMD$ (ii) ΔDBC is a right angle (iii) $\Delta DBC \cong \Delta ACB$ (iv) $CM = \frac{1}{2}AB$ Given, to prove and figure (0.5) Correct proof (3.5)	4 
39	Prove that the angle subtended by an arc at centre is double the angle subtended by same chord at any other point on the remaining part of the circle. OR If two equal chords of a circle intersect within the circle, prove that the segments of one chord are equal to corresponding segments of the other chord. Given.....(0.5) To prove.....(0.5) Fig.....(1) Correct proof.....(2.5) OR Figure(1) PQ and RS are the two equal chords of a given circle and let they are intersecting each other at point T.	4

	Now, draw perpendicular OV and OU on these chords. Now, in $\triangle OVT$ and $\triangle OUT$, $OV = OU$ {since equal chords of a circle are equidistant from the centre} $\angle OVT = \angle OUT$ {since each 90°} $OT = OT$ {common} By SAS congruence criterion, $\triangle OVT \cong \triangle OUT$.....(1) So, $VT = UT$ {By CPCT}1 Again, it is given that $PQ = RS$2 $\Rightarrow PQ/2 = RS/2$ $\Rightarrow PV = RU$3.....(0.5) Add equation 1 and 3, we get $PV + VT = RU + UT$ $\Rightarrow PT = RT$4 Subtract equation 2 and 4, we get $PQ - PT = RS - RT$ $\Rightarrow QT = ST$5.....(0.5)	
40	If $(4x)^{2x-1} - (16)^{x-1} = 384$ then, find the value of x. OR Show that: $\frac{1}{\sqrt{4}+\sqrt{5}} + \frac{1}{\sqrt{5}+\sqrt{6}} + \frac{1}{\sqrt{6}+\sqrt{7}} + \frac{1}{\sqrt{7}+\sqrt{8}} + \frac{1}{\sqrt{8}+\sqrt{9}} = 1$ $(2x)^{4x-2} - (2)^{4x-4} = 384$.....(1) $(2)^{4x}((2)^{-2} - (2)^{-4}) = 384$.....(1) $(2)^{4x} = 128 \times 16$.....(1) $(2)^{4x} = (2)^{7+4}$(0.5) $x = 11/4$.....(0.5) Rationalize each part(0.5)each Final proof (1.5)	4