INDIAN SCHOOL AL WADI AL KABIR

Class X, Mathematics

SAMPLE PAPER Set II

MCQ, ASSERTION & REASONING, CASE STUDY

29-08-2021

Multiple Choice Questions (1 Mark)

Q.1. The graph of x=3 is a line parallel to:

	A	x- axis	B	y- axis	C	both axes	D	none of these

Q.2. Let $x = \frac{11}{2^2 \times 5^3}$ be a rational number. Then x has a decimal expansion which terminates after:

	A	three places of decimal	**B**	four places of decimal
	C	two places of decimal	**D**	two places of decimal

Q.3. The distance between the points P (a + b, a - b) and Q (a - b, a + b) is:

	A	$2\sqrt{2}$ b	**B**	$2\sqrt{2a}$	**C**	4b	**D**	4a

Q.4. If $\sec\theta = \frac{13}{5}$, then $\tan\theta$ is:

	A	$\frac{5}{13}$	**B**	$\frac{12}{5}$	**C**	$\frac{5}{12}$	**D**	$\frac{12}{13}$

Q.5. If the point (k, 4) divides the join of points A (2, 6) and B(5, 1) in the ratio 2:3, then the value of k is:

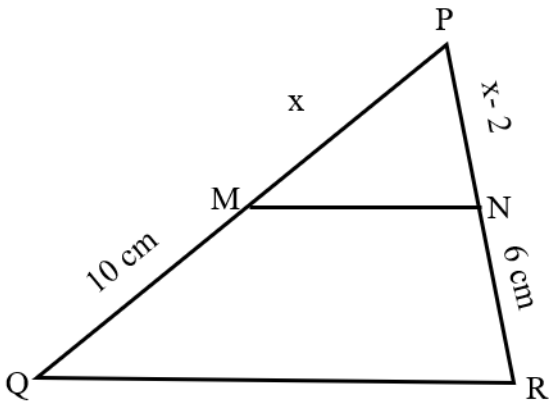
	A	16	**B**	$\frac{28}{5}$	**C**	$\frac{16}{5}$	**D**	$\frac{8}{5}$

Q.6. If tan A = 1, then 2 sin A cos A =

	A	2	**B**	cot A	**C**	sec A	**D**	1

Q.7. A quadratic polynomial whose zeroes are –3 and 4 is:

	A	$x^2 - x + 12$	**B**	$x^2 + x + 12$
	C	$\frac{x^2}{2} - \frac{x}{2} - 6$	**D**	$2x^2 + 2x - 24$

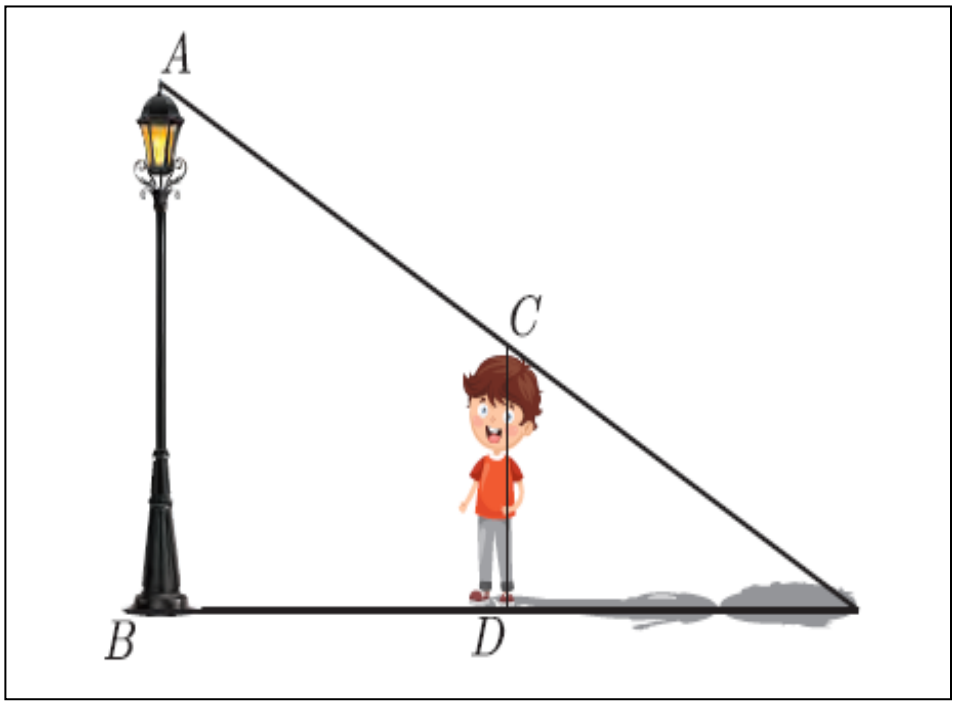
Q.8.	If 1 is one of the zeroes of the polynomial $x^2 + x + k$, then the value of k is:						
	A	2	**B**	-2	**C**	4	**D**	-4
Q.9.	If the area of a sector is $\frac{5}{18}$ of the area of a circle, the angle subtended by the sector at the centre is:						
	A	90°	**B**	100°	**C**	50°	**D**	60°
Q.10.	The probability of getting 53 Fridays in a leap year is:						
	A	$\frac{1}{7}$	**B**	$\frac{2}{7}$	**C**	$\frac{4}{7}$	**D**	$\frac{5}{7}$
Q.11.	In the given figure, MN ∥ QR. If PM = x cm, PN = (x – 2) cm, NR = 6 cm, then the value of x is:  						
	A	5 cm	**B**	7 cm	**C**	8 cm	**D**	12
Q.12.	HCF × LCM for the numbers 100 and 190 is:						
	A	190	**B**	1900	**C**	19000	**D**	100
Q.13.	The area of a square that can be inscribed in a circle of radius 5 cm is:						
	A	25	**B**	50	**C**	$\sqrt{50}$	**D**	5
Q.14.	A card is selected from a deck of 52 cards. The probability of it being a red face card is:						
	A	$\frac{5}{52}$	**B**	$\frac{7}{52}$	**C**	$\frac{3}{26}$	**D**	$\frac{5}{26}$
Q.15.	The pair of linear equations 3x +2y = 5 and 2x – 3y = 7 has:						
	A	infinite number of solutions			**B**	no solutions		
	C	unique solution			**D**	two solutions		

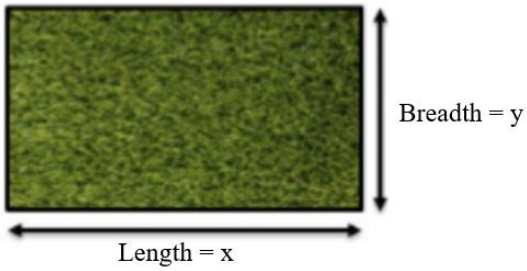
Q.16.	If two positive integers 'p' and 'q' can be expressed as $p = a^3b^2$ and $q = ab^3c^2$; a, b, c being prime numbers, then HCF (p, q) is:							
	A	abc	**B**	ab^2	**C**	$a^3b^3c^2$	**D**	$a^2b^2c^2$
Q.17.	For what value of 'k', the pair of linear equations $4x - 3y = 9$ and $2x + ky = 11$ has no solution.							
	A	$\frac{2}{3}$	**B**	$\frac{3}{2}$	**C**	$\frac{-3}{2}$	**D**	$\frac{-2}{3}$
Q.18.	If $x = a\cos\theta$ and $y = b\sin\theta$, then $b^2x^2 + a^2y^2 - a^2b^2$ is equal to:							
	A	1	**B**	0	**C**	-1	**D**	2ab
Q.19.	The distance of the point P (–6, 8) from the origin is:							
	A	8 units	**B**	10 units	**C**	$2\sqrt{7}$ units	**D**	6 units
Q.20.	The coordinates of two points are (6, 0) and (0, – 8). The coordinate of the mid-point is:							
	A	(3, 4)	**B**	(3, -4)	**C**	(0, 0)	**D**	(-4, 3)
Q.21.	If $\Delta ABC \sim \Delta DEF$, BC = 4cm, EF = 5cm and area of ΔABC is $80cm^2$, then area of ΔDEF is:							
	A	$100cm^2$	**B**	$125cm^2$	**C**	$150cm^2$	**D**	$200cm^2$
Q.22.	In a circle of diameter 42cm, if an arc subtends an angle 60° at the center where $\pi = \frac{22}{7}$, then length of arc is:							
	A	11cm	**B**	$\frac{22}{7}$ cm	**C**	22cm	**D**	44cm
Q.23.	The HCF of two numbers 'a' and 'b' is 5 and their LCM is 200. Then the product of 'a' and 'b' is:							
	A	205	**B**	1000	**C**	200	**D**	195

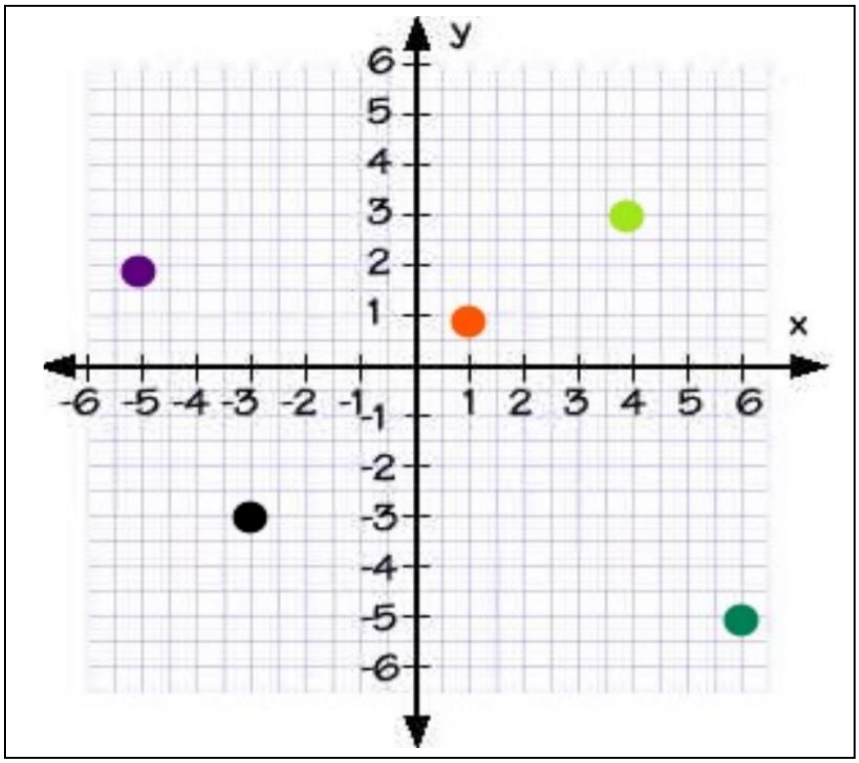
Q.24.	If the ratio of the perimeters of two similar triangles is 4 : 25, then the ratio of the areas of the similar triangles is:							
	A	16:625	**B**	2:5	**C**	5:2	**D**	625:16
Q.25.	If sin 2A= $\frac{1}{2}\tan^2 45°$ where 'A' is an acute angle, then the value of A is:							
	A	60°	**B**	45°	**C**	30°	**D**	15°
Q.26.	The rational number between $\sqrt{2}$ and $\sqrt{3}$ is:							
	A	$\frac{6}{5}$	**B**	$\frac{3}{4}$	**C**	$\frac{3}{2}$	**D**	$\frac{9}{5}$
Q.27.	In a throw of a die, the probability of getting a prime number is:							
	A	$\frac{2}{3}$	**B**	$\frac{5}{6}$	**C**	$\frac{1}{4}$	**D**	$\frac{1}{2}$

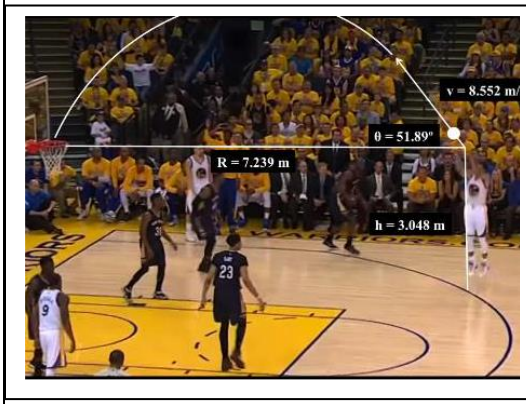
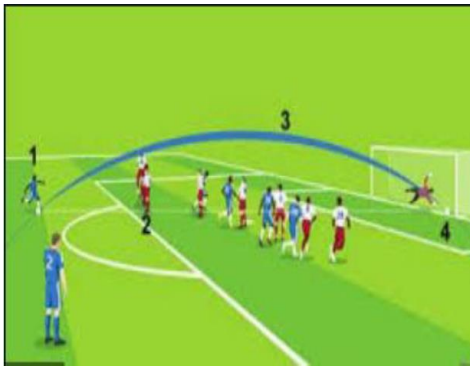
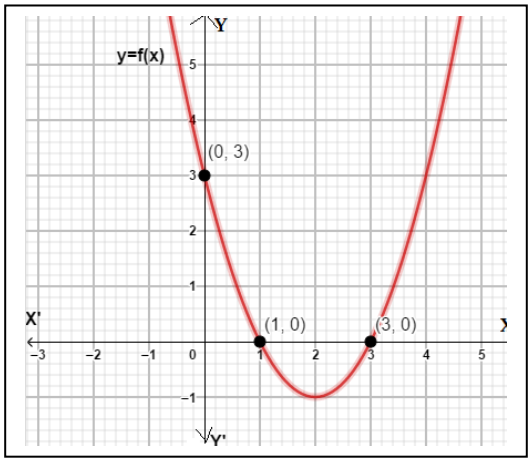
	Assertion Reason Questions: Direction: In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as: (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A). (B) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A). (C) Assertion (A) is true, but Reason (R) is false. (D)Assertion (A) is false but Reason (R) is true.
Q.28.	Assertion(A): $(2-\sqrt{3})$ is one zero of the quadratic polynomial, then other zero will be $(2+\sqrt{3})$. Reason(R): Irrational zeroes (roots) always occurs in pairs.
Q.29.	Assertion(A): $5+\sqrt{3}$ is an irrational number. Reason(R): The sum or difference of a rational and an irrational number is always irrational.
Q.30.	Assertion(A): The H.C.F. of two numbers is 16 and their product is 3072.Then their L.C.M.= 162. Reason(R): If a and b are two positive integers, then H.C.F. × L.C.M. = a × b.
Q.31.	Assertion: The pair of linear equations: $x - 2y - 3 = 0$ and $3x + 4y - 20 = 0$ have exactly one solution. Reason: The pair of linear equations: $2x + 3y - 9 = 0$ and $4x + 6y - 18 = 0$ have a unique solution.
Q.32.	Assertion(A): If a pair of dice is thrown once, then the probability of getting a sum of 8 is $\frac{5}{36}$. Reason(R): In a simultaneous toss of two coins the probability of getting exactly one head is $\frac{1}{2}$.
Q.33.	Assertion(A): Degree of a zero polynomial is not defined. Reason(R): Degree of a non-zero constant polynomial is '0'.
Q.34.	Assertion(A): If two sides of a right triangle are 7 cm and 8 cm, then its third side will be 9 cm. Reason(R): In a right triangle, the square of hypotenuse is equal to the sum of the squares of the other two sides.

Q.35.	Assertion(A): In a right-angled triangle, if cos θ = $\frac{1}{2}$ and sin θ = $\frac{\sqrt{3}}{2}$, then tan θ = $\sqrt{3}$ Reason(R): $\tan\theta = \frac{\sin\theta}{cos\theta}$
Q.36.	Assertion(A): The length of the minute hand of a clock is 7 cm. Then the area swept by the minute hand in 5 minute is $12\frac{5}{6}$ cm^2. Reason(R): The length of the arc of a sector of angle θ and radius r is given by l = $\frac{\theta}{360°} \times 2\pi r$

	Case Study Based Questions
Q.37.	**Case Study Based-1** Rohan is very intelligent in maths. He always tries to relate the concept of maths in daily life. One day he is walking away from the base of a lamp post at a speed of 1 m/s. Lamp is 4.5 m above the ground. 
a.	If after 2 second, length of his shadow is 1 meter, what is the height of Rohan? (i) 145 cm (ii) 120 cm (iii) 150 cm (iv) 175 cm
b.	What is the minimum time after which his shadow will become larger than his original height? (i) 1 sec (ii) 2 sec (iii) 3 sec (iv) 4 sec
c.	What is the distance of Rohan from the pole when the length of his shadow is equal to his height? (i) 2 m (ii) 1 m (iii) 3 m (iv) 4 m
d.	What will be the length of his shadow after 4 seconds? (i) 2 m (ii) 1 m (iii) 3 m (iv) 4 m
e.	Which similarity criterion is used in solving the above problem? (i) SAS similarity criterion (ii) AA similarity criterion (iii) SSS similarity criterion (iv) none of these

Q.38.	**Case Study Based-2** Class X students of a secondary school in Krishnagar have been allotted a rectangular plot of a land for gardening activity. They are asked to find the dimensions of the rectangular plot. To help them find out the dimensions their Mathematics teacher provided them with the following hints.  The area of the rectangle gets reduced by 9 m^2, if its length is reduced by 5m and breadth is increased by 3m. If we increase the length by 3m and breadth by 2m, the area increases by 67 m^2.
a.	The length of the rectangular garden is: (i)20 m (ii) 19 m (iii)18 m (iv)17 m
b.	The graphical representation of linear equations in two variables representing the situation is: (i) parallel lines (ii) intersecting lines (iii) coincident lines (iv) None of these
c.	Taking length as x m and breath as y m, the pair of linear equations representing the above situation is: (i) $3x - 5y = 6$; $2x + 3y = 61$ (ii) $3x - 5y = -6$; $2x + 3y = 61$ (iii) $3x - 5y = 6$; $2x + 3y = -61$ (iv) $3x + 5y = 6$; $2x + 3y = 61$
d.	The breadth of the rectangular garden is: (i)7 m (ii) 8 m (iii)9 m (iv)10 m
e.	The area of the rectangular garden is: (i) 153 m^2 (ii) 140 m^2 (iii) 170 m^2 (iv) 136 m^2

Q.39.	**Case Study Based-3** A group of students named Ria, Emma, Anna, Krish and Sahil are gathered around in the school library, in their library period. The coloured plot points on the coordinate plane shown in the above image indicates the dots where each book is available. Considering point O as the origin. The books with respect to colours are: Science guide - Violet, Mathematics guide - Light Green, English guide - Black, History guide - Orange and Sanskrit guide - Dark green 
a.	How much distance does Emma has to walk to get the Science guide, if her starting point is (0, 2)? (i)5 units towards positive Y axis (ii) 5 units towards negative X axis (iii)5 units towards positive X axis (iv) None
b.	How far apart are the English and Sanskrit guide? (i)8.2 units (ii) 9.2 units (iii) 7.5 units (iv) 6 units
c.	The co-ordinate of Mathematics guide is: (i)(3, 4) (ii) (4, 3) (iii) (6, 3) (iv) (3, 6)

d.	The distance between the location of History guide and Sahil's starting point (which is at origin) is: (i)less than 2 units (ii)greater than 2 units (iii)less than 5 units (iv)greater than 5 units
e.	Identify the position of Krish, who is reading the Sanskrit guide. (i)(-5, 6) (ii)(5, -6) (iii)(-6, 5) (iv)(6, -5)
Q.40.	**Case Study Based-4** Basketball and soccer are played with a spherical ball. Even though an athlete dribbles the ball in both sports, a basketball player uses his hands and a soccer player uses his feet. Usually, soccer is played outdoors on a large field and basketball is played indoor on a court made of wood. The projectile (path traced) of soccer ball and basketball are in the form of parabola representing quadratic polynomial.  
a.	The shape of the path traced shown is: (i) Spiral (ii) Ellipse (iii) Linear (iv) Parabola
b.	The number of zeroes of the polynomial from the graph is:  (i)1 (ii)2 (iii) 3 (iv)4

c.	For any quadratic polynomial $ax^2 + bx + c$; $a \neq 0$, the graph of parabola opens upwards, if : (i) $a = 0$ (ii) $a < 0$ (iii) $a > 0$ (iv) $a \geq 0$
d.	The expression for the polynomial f(x) of the above graph is: (i)$x^2 - x - 3$ (ii) $x^2 + x + 3$ (iii) $x^2 - 4x + 3$ (iv) $x^2 - 4x - 3$
e.	The zeroes of the polynomial are: (i)1, 3 (ii)-1, 3 (iii) 1, -3 (iv) -1,-3

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Answers

Answers								
	1	B	2	A	3	A	4	B
	5	C	6	D	7	C	8	B
	9	B	10	B	11	A	12	C
	13	C	14	C	15	C	16	B
	17	C	18	B	19	B	20	B
	21	A	22	C	23	B	24	A
	25	D	26	C	27	D	28	A
	29	A	30	D	31	C	32	B
	33	B	34	D	35	A	36	B
	37	a.(iii) b.(iii) c.(iii) d.(i) e.(ii)			38	a.(iv) b.(ii) c.(i) d.(iii) e.(i)		
	39	a.(ii) b.(ii) c.(ii) d.(i) e.(iv)			40	a.(iv) b.(ii) c.(iii) d.(iii) e.(i)		