



BLOOM PUBLIC SCHOOL

C-8 Vasant Kunj, New Delhi

Mid- Term Examination Sample Paper (2022 – 23)

Mathematics (041)

Class – X

Date:

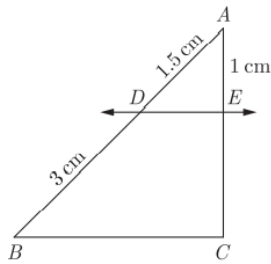
Time Allowed: 3 hours

Max. Marks: 80

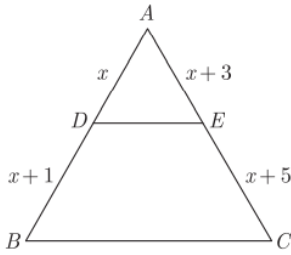

General Instructions:

- All questions are compulsory.
- This question paper consists of 38 questions divided into 5 sections A, B, C, D and E.
- Section A comprises of 20 questions of one mark each (from Q1 -20).
- Section B comprises of 5 questions of two marks each (from Q21 -25).
- Section C comprises of 6 questions of three marks each (from Q26 -31).
- Section D comprises of 4 questions of five marks each (from Q32 -35).
- Section E comprises of 03 case study questions of 4 marks each (from Q36-38).
- There is no overall choice. However, internal choice has been provided in 02 questions of section B, 02 questions of section C, 02 questions of section D. You have to attempt only one of the alternatives in such questions.

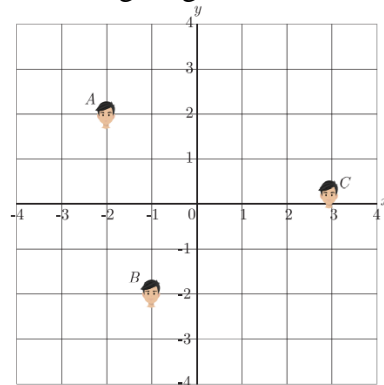
	Section A	20 M
Q1	Assertion : The HCF of two numbers is 5 and their product is 150, then their LCM is 30 Reason : For any two positive integers a and b, $HCF(a, b) + LCM(a, b) = a \times b$ (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A). (b) 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.	1
Q2	What is the value of k such that the following pair of equations have infinitely many solutions? $x-2y=3$ and $-3x+ky=-9$ a) 6 b) 3 c) -3 d) -6	1
Q3	For what value of p does the pair of linear equations given below has unique solution? $4x+py+8=0$ $2x+2y+2=0$ (a) $p=1$ (b) $p=2$ (c) $p \neq 4$ (d) $p \neq 2$	1
Q4	The roots of the equation $x^2 + 7x + 10 = 0$ are a) -5,-2 b) 5,2 c) 5,-2 d) -5,2	1
Q5	Values of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is	1

	a) 0 b) 4,0 c) 8 d) 0,8	
Q6	The nth term of an AP $a, 3a, 5a, \dots$ is a) na b) $(2n-1)a$ c) $(2n+1)a$ d) $2na$	1
Q7	For what value of k will $k+9$, $2k-1$, and $2k+7$ are the consecutive terms of an AP? a) 16 b) 2 c) 18 d) 4	1
Q8	Which of the following statement(s) is/ are false? (i) All isosceles triangles are similar. (ii) All quadrilaterals are similar. (iii) All circles are similar. (iv) All squares are similar a) i) and iii) b) i) and ii) c) iii) and iv) d) ii) and iv)	1
Q9	Assertion : The value of $\sin A = \frac{4}{3}$ is not possible. Reason: Hypotenuse is the largest side in any right angled triangle. (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.	1
Q10	The line represented by $4x - 3y = 9$ intersects the y axis at i) $(0, -3)$ ii) $(\frac{9}{4}, 0)$ iii) $(-3, 0)$ iv) $(0, \frac{9}{4})$	1
Q11	Find the sum of the exponents of the prime factors in the prime factorisation of 196.	1
Q12	The LCM of two numbers is 182 and their HCF is 13. If one of the numbers is 26, find the other.	1
Q13	Write the discriminant of the quadratic equation $(x+5)^2 = 2(5x-3)$.	1
Q14	The pair of equations $y = 0$ and $y = -7$ has _____ solution(s).	1
Q15	Which term of the following AP $27, 24, 21, \dots$ is 0.	1
Q16	How many two digit numbers are divisible by 3?	1
Q17	Write the coordinates of the centre of the circle whose end points of a diameter are $(-6, 3)$ and $(6, 4)$.	1
Q18	In the given figure, $DE \parallel BC$. The value of EC is 	1
Q19	If $\sin A + \cos B = 1$, $A = 30^\circ$ and B is an acute angle. Find the value of B.	1
Q20	If $\triangle ABC$ is right angled at C, then the value of $\cos (A + B)$ is	1

	Section B	
Q21	Find the smallest number that is a perfect square and is divisible by 16,20,24.	2
Q22	Find the quadratic polynomial whose zeroes are $(5-3\sqrt{2})$ and $(5+3\sqrt{2})$.	2
Q23	If the 8 th term of an AP is zero. Prove that its 38 th term is triple of its 18 th term.	2
Q24	Find the perimeter of a triangle with vertices (0, 4), (0, 0) and (3, 0). OR Find a linear relation between x and y such that P(x,y) is equidistant from the points A(1,4) and B (-1,2)	2
Q25	The value of $(\sin^2 A + \frac{1}{1+\tan^2 A}) =$ OR If $\operatorname{cosec} \theta = \frac{3}{2}$, find the value of $2(\operatorname{cosec}^2 \theta + \cot^2 \theta)$	2
	Section C	
Q26	Using prime factorisation method, find the HCF and LCM of 72,126 and 168. Also show that HCF x LCM \neq product of three numbers.	3
Q27	If α and β are the zeroes of the polynomial $x^2 - 5x + 6$, then find the value of $\frac{1}{\alpha^2} + \frac{1}{\beta^2}$. OR If α and β are the zeroes of the polynomial $2y^2 - y - 2$, then find the quadratic polynomial whose zeroes are 2α and 2β .	3
Q28	In a flower bed, there are 23 rose plants in the first row, 21 in the second, 19 in the third and so on. There are 5 rose plants in the last row. How many rows are there in all and the total number of rose plants? OR Raj's friend Veer wants to participate in a 200m race. He can currently run the distance in 51 seconds. With each day's practice it takes him 2 seconds less. He wants to do it in 31 seconds. What is the minimum number of days he has to practice to achieve his goal?	3
Q29	In a trapezium , show that any line drawn parallel to the parallel sides of the trapezium divides the non-parallel sides proportionally.	3
Q30	Find the coordinates of point R on the line segment joining the points P(-1,3) and Q (2,5) such that $PR = \frac{3}{5} PQ$.	3
Q31	Show that $\sec^4 \theta - \sec^2 \theta = \tan^4 \theta + \tan^2 \theta$	3
	Section D	
Q32	Check graphically whether the pair of linear equations $4x - y - 8 = 0$ and $2x - 3y + 6 = 0$ is consistent. Also find the vertices of the triangle formed by these lines with the x-axis.	5

Q33	<p>A two-digit number is such that the product of its digits is 24. If 18 is subtracted from the number, the digits interchange their places. Find the number.</p> <p style="text-align: center;">OR</p> <p>A and B working together can do a work in 6 days. If A takes 5 days less than B to finish the work, in how many days B alone can do the work?</p>	5
Q34	<p>If $\sqrt{3} \sin \theta = \cos \theta$, find the value of $\frac{\sin \theta \tan \theta (1 + \cot \theta)}{\sin \theta + \cos \theta}$.</p> <p style="text-align: center;">OR</p> <p>If $\sec \theta - \tan \theta = x$, show that $\sec \theta + \tan \theta = \frac{1}{x}$ and hence find the values of $\cos \theta$ and $\sin \theta$.</p>	5
Q35	<p>a) State and prove Thale's Theorem. b) In $\triangle ABC$, $DE \parallel BC$. Find x.</p> <div style="text-align: center;">  </div>	5
Section E		
Q36	 <p>A barrels manufacturer can produce up to 300 barrels per day. The profit made from the sale of these barrels can be modelled by the function $P(x) = -10x^2 + 3500x - 66000$ where $P(x)$ is the profit in rupees and x is the number of barrels made and sold.</p> <p>a) When no barrels are produce what is the profit/loss? i) Rs 22000 ii) Rs 66000 iii) Rs 11000 iv) Rs33000 b) What is the profit/loss if 175 barrels are produced? i) Profit ₹266200 ii) Loss ₹ 266200 iii) Profit ₹ 240250 iv) Loss ₹ 240250 c) What is the number of barrels made and sold to breakeven? (Zero profit point is called breakeven)</p>	4 (1+1+2)
Q37	Ajay, Bhavya and Colin are fast friend since childhood. They always want to sit in a row in the classroom. Bhavya is very	4 (1+1+2)

good in maths and he does distance calculation every day. He considers the centre of class as origin and marks their position on a paper in a co-ordinate system. One day Bhavya makes the following diagram of their seating position.



- What is the distance of point A from origin?
i) 8 ii) $2\sqrt{2}$ iii) 4 iv) $4\sqrt{2}$
- What is the distance between A and B?
i) $3\sqrt{19}$ ii) $3\sqrt{5}$ iii) $\sqrt{17}$ iv) $2\sqrt{5}$
- A point D lies on the line segment between points A and B such that $AD:DB = 4:3$. What are the coordinates of point D?

Q38

Saving a certain amount for future is a good habit. Ramesh is student of class X and he inculcated the habit of saving. Recently, Ramesh have received a Prize Money of Rs 10000 in an Art competition. He deposited it with a bank. The bank offers him a simple interest at the rate of 6.5% per year. He has a plan to use this money to some books and stationary.



- What is the interest he receives in the first year?
i) Rs 650 ii) Rs 65 iii) Rs 6500 iv) Rs 10000
- What is the total money he receives after 10 years?
Rs 6500 ii) Rs 10650 iii) Rs 16500 iv) Rs 10000
- Write the sequence for the amount of money at the end of each year. What kind of sequence is it and why?

4
(1+1+2)

