

Tender Heart High School, Sector 33B, Chd.

Class 10

Maths

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Revision - 1

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Q1(a) Using componendo and dividendo, find the value of x , given

$$\frac{\sqrt{3x+4} + \sqrt{3x-5}}{\sqrt{3x+4} - \sqrt{3x-5}} = 9$$

(b) Given $A = \begin{bmatrix} 3 & 0 \\ 0 & 4 \end{bmatrix}$, $B = \begin{bmatrix} a & b \\ 0 & c \end{bmatrix}$

and $AB = A+B$, find the values of a, b, c

(c) Which term of the A.P. 121, 117, 113, --- is the first negative term?

Q2(a) The denominator of a fraction is one more than twice the numerator. If the sum of fraction and its reciprocal is $2\frac{16}{21}$, find the fraction.

(b) If -4 is a root of the quadratic equation $x^2 + px - 4 = 0$ and the quadratic equation $x^2 + px + k = 0$ has equal roots, find the value of ' k '.

(c) Given $P = \{x : 5 < 2x - 3 \leq 11, x \in \mathbb{R}\}$
 $Q = \{x : -1 \leq 3 + 4x < 27, x \in \mathbb{I}\}$

Represent P and Q on two different number lines. Write down the elements of $P \cap Q$.

Q3(a) Given that $(x+1)$ and $(x-2)$ are factors of $x^3 + ax^2 - bx - 6$, find the values of ' a ' and ' b '. With these values of ' a ' and ' b ', factorise the given expression completely.

(b) If

$$A = \begin{bmatrix} 3 & 1 \\ -1 & 2 \end{bmatrix}, \text{ find the value of}$$

$A^2 - 5A + 7I$, where I is the unit matrix.

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- (c) Solve the following inequation, write the solution set and represent it on the number line :-

$$-\frac{x}{3} \leq \frac{x}{2} - 1\frac{1}{3} < \frac{1}{6}, x \in \mathbb{R}$$

- Q4(a) Show that $(2x+7)$ is a factor of $2x^3 + 7x^2 - 4x - 14$. Hence, factorise $2x^3 + 7x^2 - 4x - 14$

- (c) Using properties of proportion, find $x:y$ if

$$\frac{x^3 + 12x}{6x^2 + 8} = \frac{y^3 + 27y}{9y^2 + 27}$$

- Q5(a) What number should be subtracted from $2x^3 - 5x^2 + 5x$ so that the resulting polynomial has a factor $2x-3$.

- (b) Solve the following inequation and represent the solution set on a number line:-

$$-8\frac{1}{2} < -\frac{1}{2} - 4x \leq 7\frac{1}{2}, x \in \mathbb{I}$$

- (c) Find the nature of the roots of the following quadratic equation. If the real roots exist, find them:-

$$3x^2 - 4\sqrt{3}x + 4 = 0$$

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Q6(a) If $\begin{bmatrix} 2 & 4 \\ 6 & 2 \end{bmatrix} \begin{bmatrix} 3x \\ 2 \end{bmatrix} + 2 \begin{bmatrix} 3 \\ 4 \end{bmatrix} = 5 \begin{bmatrix} 4 \\ y \end{bmatrix}$,

find the values of x and y .

(b) The 2nd and 45th terms of an A.P. are 10 and 96 respectively. Find the A.P. and hence, find the sum of the first 15 terms.

(c) Solve the following inequation and represent your solution on the real number line:-

$$-5\frac{1}{2} - x \leq \frac{1}{2} - 3x \leq 3\frac{1}{2} - x, x \in \mathbb{R}$$

Q7(a) Using properties of proportion solve for x , given

$$\frac{\sqrt{5x} + \sqrt{2x-6}}{\sqrt{5x} - \sqrt{2x-6}} = 4$$

(b) If $(x-2)$ is a factor of the expression $2x^3 + ax^2 + bx - 14$ and when the expression is divided by $(x-3)$, it leaves a remainder 52, find the values of a and b .

(c) Amit deposits ₹1600 per month in a bank for 18 months in a recurring deposit account. If he gets ₹31080 at the time of maturity. What is the rate of interest per annum?

Q8(a) If $A = \begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix}$, find x and y so that

$A^2 = xA + yI$, where I is a 2×2 identity matrix.

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(b) If $\frac{7m+2n}{7m-2n} = \frac{5}{3}$, use properties of proportion to find

(i) $m:n$

(ii) $\frac{m^2+n^2}{m^2-n^2}$

(c) Find the value of a and b if $(x-1)$ and $(x-2)$ are factors of x^3-ax+b

Q9(a) Using the Remainder and Factor theorem, factorise the following polynomial:-
 $x^3 + 10x^2 - 37x + 26$.

(b) Solve the given equation by using quadratic formula and give your answer correct to 2 decimal place
 $x^2 - 5x - 10 = 0$

(c) Find the 31st term of an A.P. whose 11th term is 38 and 6th term is 73.

Q10(a) If $2 \begin{bmatrix} 3 & x \\ 0 & 1 \end{bmatrix} + 3 \begin{bmatrix} 1 & 3 \\ y & 2 \end{bmatrix} = \begin{bmatrix} z & -7 \\ 15 & 8 \end{bmatrix}$
find the values of x, y, z

(b) Ria purchased a mobile phone for ₹ 37170, which includes a discount of 10% on the printed price and 18% GST on the remaining price. Find the printed price of the mobile phone.

(c) What number must be added to each of the numbers 5, 11, 19 and 37 so that they are in proportion.