MATHS CLASS X Continuation.....

CHAPTER 5 (QUADRATIC EQUATIONS IN ONE VARIABLE)

General direction for the students :-Whatever be the notes provided , everything must be copied in the Maths Copy and then do the Home work in the same Copy.

SOLVING A QUADRATIC EQUATION BY FORMULA

Let the given equation be $ax^2 + bx + c = 0$, then the roots are $x = \frac{-b \mp \sqrt{b^2 - 4ac}}{2a}$, is known as Quadratic formula. Here $b^2 - 4ac$ is known as Discriminant (D or Δ) of the equation.

EXERCISE 5.3

Q2 ii). Solve $(2x + 3)(3x - 2) + 2 = 0$

$$\Rightarrow 6x^2 + 5x - 4 = 0$$

Here $a = 6$, $b = 5$, $c = -4$

We know $x = \frac{-b \mp \sqrt{b^2 - 4ac}}{2a}$

$$= \frac{-5 \mp \sqrt{5^2 - 4.6.-4}}{2.6}$$

$$= \frac{-5 \mp 11}{12}$$

$$= \frac{-16}{12} , \frac{6}{12}$$

$$= -1.333 \ldots , 0.5$$

$$= -1.33 , 0.5 \text{ approx}$$

Q8. Solve $\frac{1}{x-2} + \frac{1}{x-3} + \frac{1}{x-4} = 0$

$$\Rightarrow \frac{(x-3)(x-4)+(x-2)(x-4)+(x-2)(x-3)}{(x-2)(x-3)(x-4)} = 0$$

$$\Rightarrow 3x^2 - 18x + 26 = 0$$

$$\Rightarrow x = \frac{18 \mp \sqrt{(-18)^2 - 4.3.26}}{2.3}$$

$$\Rightarrow x = \frac{18 \mp \sqrt{12}}{6}$$

$$\Rightarrow x = \frac{9 \mp \sqrt{3}}{3}$$

$\Rightarrow x = \frac{9 \mp 1.732}{3}$

$\Rightarrow x = 3.577\ ,\ 2.422$ approx

$\Rightarrow x = 3.58\ , 2.42$ nearest 2 decimal places

Q10 ii) Solve $x^2 + 7x = 7$

$\Rightarrow x^2 + 7x - 7 = 0$

$\Rightarrow x = \frac{-7 \mp \sqrt{7^2 - 4.1.-7}}{2.1}$

$\Rightarrow x = \frac{-7 \mp \sqrt{77}}{2}$

$\Rightarrow x = \frac{-7 \mp 8.774}{2}$

$\Rightarrow x = \frac{-15.774}{2}\ , \frac{1.774}{2}$

$\Rightarrow x = -7.887\ , 0.887$ $\Rightarrow x = -7.89\ , 0.89$ nearest 2 decimal places.

Q13). $5x^2 - 3x - 4 = 0$

$\Rightarrow x = \frac{3 \mp \sqrt{(-3)^2 - 4.5.-4}}{2.5}$

$\Rightarrow x = \frac{3 \mp \sqrt{89}}{10}$

$\Rightarrow x = \frac{3 \mp 9.433}{10}$

$\Rightarrow x = 1.243, -0.6433$

$\Rightarrow x = 1.24\ , -0.643$ nearest 3 significant figure.

HOME WORK : Left over questions from the exercise 5.3