STEPPING STONE SCHOOL (HIGH)

CLASS : X

Subject: Mathematics
Date: 4/5/2020
Topic: Quadratic Equation **Time Limit:1 hour**

Worksheet No. :7

[Copy the questions and solve them on a sheet of paper date wise. Keep the worksheets ready in a file to be submitted on the opening day.]

Concept :

We have learnt $x=(-b \pm\sqrt{}\ (b^2-4ac))/2a$ from $ax^2 + bx+c=0$, here we denote $b^2-4ac=D=$Discriminate, as it determines the nature of the roots ie if $D\geq 0$ => roots are real ; and if $D<0$ then roots are imaginary. Moreover if $D=0$ then roots are equal e.g

$x^2-8x+16=0$ has $D= (-8)^2-4.1.16=64-64=0$, => so roots will be $x= (-8(-8)+0)/2.1$, from shreedhar Achrya formula) => $x=4$ means both roots are '4' and '4'. Actually the above equation can be written as $(x-4)(x-4)=0$ ie $(x-4)^2=0$.If the roots are different viz take '2' and '3' then the equation becomes :

`$(x-2)(x-3)=0$=> $x^2-(2+3)x+6=0$ =>$x^2-5x+6=0$

Here $D=(-5)^2-4.1.6=25-24=1 != 0$ hence there their roots are

$x= (-(-5) \pm\sqrt{1})/2.1= (5\pm1)/2 =3,2$. So if the roots are α and β

Then the equation becomes $(x- \alpha) (x- \beta)=0$

$\Rightarrow x^2 -(\alpha + \beta)x+ \alpha.\beta =0 \Rightarrow x^2 -(SOR)x+POR=0$

Where SOR =sum of roots and POR=product of roots.

Using the above form of equation form quadratic equation if roots are $2\sqrt{} \pm3$: Ans SOR = 4 and POR=1, so equation will be $x^2-4x+1=0$.

Exercise 1) Solve by Sridhar Achariya formula

i) $5x^2-2x-3=0$

ii) $x^2=18x-77$

iii) $\sqrt{3}\, x^2 + 11x +6\sqrt{3}=0$

iv) $x-(18/x)=6$

v) $2x^4 - 5x^2+3=0$

vi) $(x^2+3x)^2-(x^2+3x)-6=0$

vii) $\sqrt{(x/1-x)}+ \sqrt{(1-x)/x}=13/6$, $x != 1$

To be continued.