Today's Plan:

Learning Target (standard): I will determine the number of x-intercepts and find them, if they exist, for a quadratic equation.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

Assessment: Board work, homework check and homework assignment

Differentiation: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

p.342 #28-56 (by 4)

$28) y = 1, 5$

$32) s = 4, \frac{35}{4}$

$36) x = 6, 9$

$40) x = -2$

$44) z = -1, 5$

$48) p = 3, 5$

$52) s = \frac{3}{2}, 1$

$56) t = -\frac{11}{5}, 1$

Solve.

$x - 5x^{\frac{1}{2}} + 6 = 0$

6
-3 + -2 = -5

$x - 3x^{\frac{1}{2}} - 2x^{\frac{1}{2}} + 6 = 0$

$x^{\frac{1}{2}}(x^{\frac{1}{2}} - 3) - 2(x^{\frac{1}{2}} - 3) = 0$

$(x^{\frac{1}{2}} - 3)(x^{\frac{1}{2}} - 2) = 0$

$x^{\frac{1}{2}} - 3 = 0$ $\quad x^{\frac{1}{2}} - 2 = 0$

$(x^{\frac{1}{2}})^2 = 3^2$ $\quad (x^{\frac{1}{2}})^2 = 2^2$

$x = 9$ $\quad x = 4$

$x = 9, 4$

$x = 9$

$9 - 5(9)^{\frac{1}{2}} + 6 \stackrel{?}{=} 0$

$9 - 15 + 6 = 0$ ✓

$x = 4$

$4 - 5(4)^{\frac{1}{2}} + 6 \stackrel{?}{=} 0$

$4 - 10 + 6 = 0$ ✓

Solve.

$y^4 - 5y^2 + 4 = 0$

4
-4 + -1 = -5

$y^4 - 4y^2 - y^2 + 4 = 0$

$y^2(y^2 - 4) - 1(y^2 - 4) = 0$

$(y^2 - 4)(y^2 - 1) = 0$

$(y + 2)(y - 2)(y + 1)(y - 1) = 0$

$y = -2, 2, -1, 1$

Solve.

$\sqrt{4y+1}-y=1$

$(\sqrt{4y+1})^2=(y+1)^2$

$4y+1=y^2+2y+1$

$0=y^2-2y$

$0=y(y-2)$

$y=0,2$

$y=0$

$\sqrt{0+1}-0=1$

$\sqrt{1}-0=1$

$1-0=1$ ✓

$y=2$

$\sqrt{8+1}-2=1$

$3-2=1$ ✓

x-Intercepts (I_x) of a Quadratic Equation:

- the discriminant of a quadratic equation is used to tell what kind of solutions it will have and how many
- the solutions to an equation are the x-values that make the equation equal to 0 or the x-value of the x-intercepts

$b^2 - 4ac$ is the discriminant

- if $b^2 - 4ac < 0$ the equation has no x-intercepts
- if $b^2 - 4ac = 0$ the equation has 1 x-intercept
- if $b^2 - 4ac > 0$ the equation has 2 x-intercepts

State the number of x-intercepts and find them if they exist. Also find the vertex.

$$y = x^2 - x - 2$$

$a=1$
$b=-1$
$c=-2$

b^2-4ac
$(-1)^2-4(1)(-2)$
$1+8$
$9>0$ 2 Ix

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$
$$=\frac{1\pm\sqrt{9}}{2(1)}$$
$$=\frac{1\pm3}{2}$$

$x=2,-1$

Ix: $(2,0),(-1,0)$

Assignment:

p.352 #28-80 (by 4)