W Section 12

~~Jan 18, 2017~~ Jan 19

Last time Problems from §1.5 pg 55

(homework: last block of problems (see end of notes)
Read 1.6 Word problems.)

#45.) $x^2 + 2x - 5 = 0$

$(x^2 + 2x + 1^2 - 1^2) - 5 = 0$

$a = 1$

completes the square

balances equation.

$(x+1)^2 - 1 - 5 = 0$

$(x+1)^2 = 6$ *

$|x+1| = \sqrt{6}$

$x + 1 = \pm\sqrt{6}$

$x = -1 \pm \sqrt{6}$

Recall: Squaring formula:

$(x+a)^2 = x^2 + 2ax + a^2$

(*) Algebra Identity:

$\sqrt{x^2} = |x|$

#46.) $x^2 - 4x + 2 = 0$

$(x^2 - 4x + (-2)^2 - (-2)^2) + 2 = 0$

$2a = -4$, $a = -2$; $a^2$; $a^2$

$(x-2)^2 - 4 + 2 = 0$

$(x-2)^2 = 2$

$|x-2| = \sqrt{2}$

$x - 2 = \pm\sqrt{2}$

$x = 2 \pm \sqrt{2}$

Example: Complete the square:

(a) $x^2+8x-3$

$= (x^2+8x+(4)^2-(4)^2)-3$

$= ((x+4)^2-16)-3$

$= \boxed{(x+4)^2-19}$

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#49.

#49.) $2x^2+8x+1=0$

$2(x^2+4x+(2)^2-(2)^2)+1=0$

$2((x+2)^2-4)+1=0$

$2(x+2)^2-8+1=0$

$2(x+2)^2=7$

$\boxed{x=-2\pm\sqrt{3.5}}$

52) $-2x^2+6x+3=0$

$-2(x^2-3x+(1.5)^2-(1.5)^2)+3=0$

$-2((x-1.5)^2-2.25)+3=0$

$-2(x-1.5)^2+4.5+3=0$

$-2(x-1.5)^2=-7.5=-15/2$

$x=1.5\pm\sqrt{15/4}=\dfrac{3\pm\sqrt{15}}{2}$

**Quadratic Formula:** The solutions to $ax^2+bx^2+c=0$

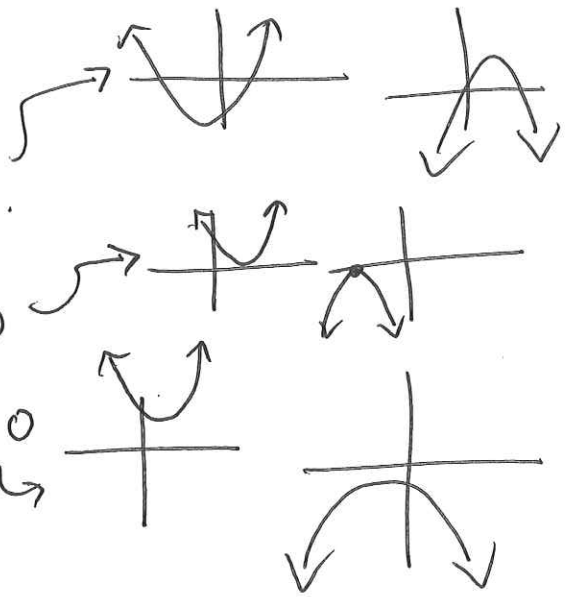
$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

**Discriminant:** $D = b^2-4ac$

If there are 2 real solutions; $D>0$

If there is 1 real solution; $D=0$

If there is no real solution; $D<0$



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#65.) $\underset{a}{\sqrt{6}}\,x^2 + \underset{b}{2}x - \underset{c}{\sqrt{3/2}} = 0$

Q.F.

$$x = \frac{-2 \pm \sqrt{4 - 4\sqrt{6}\cdot\sqrt{3/2}}}{2\sqrt{6}}$$

$$= \frac{-2 \pm \sqrt{4+12}}{2\sqrt{6}}$$

$$= \frac{-2 \pm \sqrt{16}^{4}}{2\sqrt{6}}$$

$$= \frac{-6}{2\sqrt{6}} \text{ or } \frac{2}{2\sqrt{6}}$$

$$= \boxed{\frac{-3}{\sqrt{6}} \text{ or } \frac{1}{\sqrt{6}}}$$

~~#69.)~~

$\sqrt{6}\cdot\sqrt{3/2} = \sqrt{6\cdot 3/2}$

$= \sqrt{9} = 3$

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#69.) Find the # of solutions.

$x^2-6x+1$

$D = b^2-4ac$

$= 36-4(1)(1)$

$= 36-4 = 32$

$\Rightarrow 32 > 0$

$\Rightarrow$ **2 Solutions**

In groups 2-4; solve 79, 81, 85, 89, 91