11.3 p738

If $Ax^2+Bx+C=0$

then $x=\frac{-B\pm\sqrt{B^2-4AC}}{2A}$

ex 6 $x^2+3x-28=0$

$A=1 \quad B=3 \quad C=-28$

$x=\frac{-3\pm\sqrt{3^2-4(1)(-28)}}{2(1)}=\frac{-3\pm\sqrt{9+112}}{2}$

$=\frac{-3\pm\sqrt{121}}{2}=\frac{-3\pm11}{2}$

$\frac{8}{2}=4$

$\frac{-14}{2}=-7$

Apr 13-6:27 PM

ex 10 $9x^2+6x=1$

$-1 \quad -1$

$9x^2+6x-1=0$

$A=9 \quad B=6 \quad C=-1$

$x=\frac{-B\pm\sqrt{B^2-4AC}}{2A}=\frac{-6\pm\sqrt{6^2-4(9)(-1)}}{2(9)}$

$=\frac{-6\pm\sqrt{36+36}}{18}=\frac{-6\pm\sqrt{72}}{18}=\frac{-6\pm\sqrt{36}\sqrt{2}}{18}$

$=\frac{-6\pm6\sqrt{2}}{18}=\frac{-1\pm\sqrt{2}}{3}$

Apr 13-6:43 PM

ex 18 $p^2 + \frac{p}{3} = \frac{1}{6}$

LCD

$6\left(p^2 + \frac{p}{3} - \frac{1}{6}\right) = 0 \cdot 6$

$6p^2 + 2p - 1 = 0$ (A = 6, B = 2, C = −1)

$p = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A} = \frac{-2 \pm \sqrt{2^2 - 4(6)(-1)}}{2(6)}$

$= \frac{-2 \pm \sqrt{28}}{12} = \frac{-2 \pm \sqrt{4}\sqrt{7}}{12} = \frac{-2 \pm 2\sqrt{7}}{12}$

$= \frac{-1 \pm \sqrt{7}}{6}$

Apr 13-6:48 PM

ex 22 $(x+1)(x-7) = 1$

$x^2 - 7x + x - 7 = 1$

$-1 \quad -1$

$x^2 - 6x - 8 = 0$ A = 1 B = −6 C = −8

$x = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A} = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(-8)}}{2(1)}$

$= \frac{6 \pm \sqrt{36+32}}{2} = \frac{6 \pm \sqrt{68}}{2} = \frac{6 \pm \sqrt{4}\sqrt{17}}{2}$

$= \frac{6 \pm 2\sqrt{17}}{2} = 3 \pm \sqrt{17}$

Apr 13-6:54 PM

ex 25 $p = \frac{5(5-p)}{3(p+1)} \xrightarrow{(3p+3)} p = \frac{25-5p}{3p+3}$

$3p^2 + 3p = 25 - 5p$

$+5p - 25 \quad -25 + 5p$

$A = 3 \quad B = 8 \quad C = -25 \qquad 3p^2 + 8p - 25 = 0$

$p = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A} = \frac{-8 \pm \sqrt{8^2 - 4(3)(-25)}}{2(3)} =$

$\frac{-8 \pm \sqrt{64 + 300}}{6} = \frac{-8 \pm \sqrt{364}}{6} = \frac{-8 \pm 2\sqrt{91}}{6}$

$= \frac{-4 \pm \sqrt{91}}{3}$

Apr 13-6:59 PM

ex 28 $(2x-1)^2 = x + 2$

$(2x-1)(2x-1) = x + 2$

$4x^2 - 4x + 1 = x + 2$

$-x - 2 \quad -x - 2 \qquad A = 4 \quad B = -5 \quad C = -1$

$4x^2 - 5x - 1 = 0 \rightarrow x = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$

$= \frac{5 \pm \sqrt{25 + 16}}{8} = \frac{5 \pm \sqrt{41}}{8}$

Apr 13-7:06 PM

ex 30 $x^2 - 5x + 20 = 0$

$A = 1 \quad B = -5 \quad C = 20$

$$x = \frac{5 \pm \sqrt{25 - 80}}{2} = \frac{5 \pm \sqrt{-55}}{2}$$

$$= \frac{5 \pm i\sqrt{55}}{2}$$

Apr 13-7:13 PM

ex 32 $t^2 + 4t + 11 = 0$

$A = 1 \quad B = 4 \quad C = 11$

$$t = \frac{-4 \pm \sqrt{16 - 44}}{2} = \frac{-4 \pm \sqrt{-28}}{2}$$

$$= \frac{-4 \pm \sqrt{-1}\sqrt{4}\sqrt{7}}{2} = \frac{-4 \pm 2i\sqrt{7}}{2} = -2 \pm i\sqrt{7}$$

Apr 13-7:15 PM

ex 34 $9x^2 - 6x = -7$

$+7 \quad +7$

$9x^2 - 6x + 7 = 0$

(A = 9, B = −6, C = +7)

$x = \frac{6 \pm \sqrt{36 - 252}}{18} = \frac{6 \pm \sqrt{-216}}{18}$

$= \frac{6 \pm \sqrt{-1}\sqrt{36}\sqrt{6}}{18} = \frac{6 \pm 6i\sqrt{6}}{18} = \frac{1 \pm i\sqrt{6}}{3}$

Apr 13-7:19 PM

ex 38 $(x-1)(9x-3) = -2$

$9x^2 - 12x + 3 = -2$

$+2 \quad +2$

$9x^2 - 12x + 5 = 0$

(A = 9, B = −12, C = +5)

$x = \frac{12 \pm \sqrt{144 - 180}}{18} = \frac{12 \pm \sqrt{-36}}{18} = \frac{12 \pm 6i}{18}$

$= \frac{2 \pm i}{3}$.

Apr 13-7:22 PM

ex40

Discriminant: $B^2 - 4AC$

$4x^2 - 28x + 49 = 0$ → $(-28)^2 - 4(4)(49) =$

A B C

$784 - 784 = 0$

ex42 $9x^2 - 12x - 1 = 0$ 1 rational soln

$B^2 - 4AC = (-12)^2 - 4(9)(-1)$

$= 144 + 36 = 180$ ← positive, but not a square

2 irrational solns.

Apr 13-7:30 PM

ex44 $4x^2 = 4x + 3$

$-4x \quad -4x \quad -3$

-3

$4x^2 - 4x - 3 = 0$

$B^2 - 4AC$

$(-4)^2 - 4(4)(-3) =$

$16 + 48 = 64$

positive square

2 rational solns.

Apr 13-7:35 PM

ex 6 $18x^2 + 60x + 82 = 0$

$B^2 - 4AC = 60^2 - 4(18)(82)$

$= 3600 - 5904 = -\#$

2 nonreal complex solutions

Apr 13-7:37 PM

11.4 p. 753 ex 8 $x \cdot \frac{-12}{x} = (x+8)x$

$-12 = x^2 + 8x$

$+12 \qquad +12$

$0 = x^2 + 8x + 12$

$(x+6)(x+2) = 0$

$x+6=0 \quad x+2=0$

$x = -6$ or -2

Apr 13-7:39 PM

ex 14

$4m(m+9)\left(\frac{2}{m}+\frac{3}{m+9}\right)=\left(\frac{11}{4}\right)4m(m+9)$

$4(m+9)(2)+4m(3)=11m(m+9)$

$8m+72+12m=11m^2+99m$

$-8m\ -72\ -12m\qquad -12m\ -8m\ -72$

$0=11m^2+79m-72$

$m=\frac{-79\pm\sqrt{79^2-4(11)(-72)}}{22}=\frac{-79\pm\sqrt{9409}}{22}$

$=\frac{-79\pm 97}{22}$ → $\frac{18}{22}=\frac{9}{11}$

$-\frac{176}{22}=-8$

Apr 13-7:43 PM

ex 20

$(3z+2)^2\cdot\left(1+\frac{2}{3z+2}\right)=\left(\frac{15}{(3z+2)^2}\right)(3z+2)^2$

$(3z+2)^2+2(3z+2)^1=15$

$9z^2+12z+4+6z+4=15$

$-15\qquad -15$

$9z^2+18z-7=0$

$(3z+7)(3z-1)=0$

$3z+7=0$ $\qquad 3z-1=0$

$3z=-7$ $\qquad 3z=1$

$z=\frac{-7}{3}$ $\qquad z=\frac{1}{3}$

or $z=\frac{-18\pm\sqrt{18^2-4(9)(-7)}}{18}$

$=\frac{-18\pm\sqrt{324+252}}{18}$

$=\frac{-18\pm\sqrt{576}}{18}$

$=\frac{-18\pm 24}{18}$

$\frac{6}{18}$ $\qquad -\frac{42}{18}$

$\frac{1}{3}$ $\qquad -\frac{7}{3}$

Apr 13-7:53 PM

ex 26 m hours to grade 1 set

a) $\frac{1}{m}$ $\frac{\text{sets}}{\text{hour}}$ b) in 2 hours we finish $\frac{2}{m}$

Apr 13-8:00 PM

ex 28 x = Jaime's time alone

$x-2$ = Carlos' time alone

	Rate	* time together	= fractional part of lab done
Carlos	$\frac{1}{x-2}$	2	$\frac{2}{x-2}$
Jaime	$\frac{1}{x}$	2	$\frac{2}{x}$

$\frac{x(x-2)}{1}\left(\frac{2}{x-2}+\frac{2}{x}\right)=1\cdot x(x-2)$

$2x+2x-4=x^2-2x$

$-2x\quad -2x+4\quad -2x+4$

$0=x^2-6x+4$

$x=\frac{6\pm\sqrt{36-16}}{2}=\frac{6\pm\sqrt{20}}{2}\quad\frac{6\pm4.5}{2}$

$\frac{10.5}{2}=5.25$ Jaime

or $\frac{1.5}{2}=.75$ ~~x~~

Carlos $x-2$

$5.25-2$

3.25

Apr 13-8:04 PM

ex 40 $z^2 = (\sqrt{5z-4})^2$

$z^2 = 5z - 4$

Apr 13-8:18 PM