33, 37, 57

33. $\frac{6r^2}{6} + \frac{6r}{6} + \frac{12}{6} = \frac{0}{6}$

$r^2 + 1r + 2 = 0$

$-2 \quad -2$

$r^2 + 1r + \frac{1}{4} = -2\frac{4}{4} + \frac{1}{4}$ $\quad \frac{1}{2}\cdot\frac{1}{2} = \frac{1}{4}$

$= -\frac{8}{4} + \frac{1}{4}$

$(r + \frac{1}{2})^2 = -\frac{7}{4}$

$\sqrt{(r+\frac{1}{2})^2} = \sqrt{-\frac{7}{4}}$

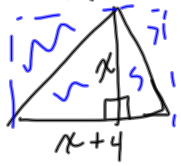
$r + \frac{1}{2} = \frac{i\sqrt{7}}{2}$

$-\frac{1}{2} \quad -\frac{1}{2}$

$r = -\frac{1}{2} + \frac{i\sqrt{7}}{2}$

$\frac{-1 + i\sqrt{2}}{2}$

37. $A_\Delta = 40$ $\quad A = \frac{1}{2}b\cdot h$



$2\cdot 40 = \frac{1}{2}(x+4)x\cdot 2$

$80 = x(x+4)$

$80 = x^2 + 4x \quad -80$

-80

$0 = x^2 + 4x - 80$

$+80 \qquad +80$

$80 \pm 4 = x^2 + 4x \pm 4$

$(x+2)^2$

$0 = \frac{1}{2}x^2 + 2x + 40$

$84 = (x+2)^2$

$\pm\sqrt{84} = \sqrt{(x+2)^2}$

$\pm 2\sqrt{21} = x + 2$

$-2 \quad -2$

$-2 \pm 2\sqrt{21} = x$

$-2 + 2\sqrt{21}$

~~$-2 - 2\sqrt{21}$~~

Apr 16-8:22 AM

57. $0.4v^2 + 0.7v = 0.3v - 2$

$-0.3v+2 \quad -0.3v+2$

$0.4v^2 + 0.4v + 2 = 0$

$\frac{0.4v^2}{0.4} + \frac{0.4v}{0.4} + \frac{2}{0.4} = \frac{0}{0.4}$

$v^2 + v + 5 = 0$

$-5 \quad -5$

$v^2 + v + \frac{1}{4} = -5 + \frac{1}{4} = -\frac{20}{4} + \frac{1}{4}$

$\left(v + \frac{1}{2}\right)^2 = -\frac{19}{4}$

$\sqrt{\left(v+\frac{1}{2}\right)^2} = \pm\sqrt{\frac{-19}{4}}$

$v + \frac{1}{2} = \pm \frac{i\sqrt{19}}{2}$

$-\frac{1}{2} \quad -\frac{1}{2}$

$v = -\frac{1}{2} \pm \frac{i\sqrt{19}}{2}$

53. $x^2 + 3x + 14 = 0$

$-14 \quad -14$

$x^2 + 3x + \frac{9}{4} = -14 + \frac{9}{4} = -\frac{56}{4} + \frac{9}{4}$

$\left(x + \frac{3}{2}\right)^2 = -\frac{47}{4}$

$\sqrt{\left(x+\frac{3}{2}\right)^2} = \pm\sqrt{-\frac{47}{4}}$

$x + \frac{3}{2} = \pm \frac{i\sqrt{47}}{2}$

$-\frac{3}{2} \quad -\frac{3}{2}$

$x = -\frac{3}{2} \pm \frac{i\sqrt{47}}{2}$

13.
21.
37.
57.

13. $x^2+6x+\boxed{c}=9$

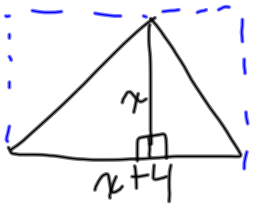
$(x+3)^2$

$c=9$

21. x^2-x+c $\quad -\frac{1}{2}\cdot-\frac{1}{2}=\frac{1}{4}$

$(x-\frac{1}{2})^2$ $\quad c=\frac{1}{4}$

37. $A_\triangle = 40$



$A=\frac{1}{2}bh$

$40=\frac{1}{2}(x+4)(x)$

$2\cdot 40 = 2\cdot\frac{1}{2}(x^2+4x)$

$40=\frac{1}{2}x^2+2x$

$-40 \qquad -40$

$2\cdot 0 = 2\left(\frac{1}{2}x^2+2x-40\right)$

$0=x^2+4x-80$

$+80 \qquad +80$

$+4+80=x^2+4x+4$

$84=(x+2)^2$

$\pm\sqrt{84}=\sqrt{(x+2)^2}$

$\pm 2\sqrt{21}=x+2$

$-2 \qquad -2$

$-2\pm 2\sqrt{21}=x$

2 > 4
2
3
7 > 21

$-2+2\sqrt{21}$

~~$-2-2\sqrt{21}$~~

Apr 16-9:16 AM

57. $0.4v^2 + 0.7v = 0.3v - 2$

$-0.3v+2 \quad -0.3v+2$

$0.4v^2 + 0.4v + 2 = 0$

$\frac{0.4v^2}{0.4} + \frac{0.4v}{0.4} + \frac{2}{0.4} = \frac{0}{0.4}$

$v^2 + 1v + 5 = 0$

$-5 \quad -5$

$v^2 + 1v + \frac{1}{4} = -5 + \frac{1}{4}$

$v^2 + 1v + \frac{1}{4} = -\frac{20}{4} + \frac{1}{4}$

$\left(v + \frac{1}{2}\right)^2 = -\frac{19}{4}$

$\sqrt{\left(v + \frac{1}{2}\right)^2} = \pm\sqrt{-\frac{19}{4}}$

$v + \frac{1}{2} = \frac{\pm i\sqrt{19}}{2}$

$-\frac{1}{2} \quad -\frac{1}{2}$

$v = -\frac{1}{2} \pm \frac{i\sqrt{19}}{2}$

$v = \frac{-1 \pm i\sqrt{19}}{2}$

49. $y = 2x^2 - 28x + 99$

$-99 \qquad -99$

$y - 99 + 98 = 2x^2 - 28x + 98$

$y - 99 + 98 = 2(x^2 - 14x + 49)$

$y - 1 = 2(x-7)^2$

$+1 \qquad +1$

$y = 2(x-7)^2 + 1$

Apr 16-9:25 AM

Sec. 1.8 Use the Quadratic Formula and the Discriminant

$$\frac{ax^2}{a} + \frac{bx}{a} + \frac{c}{a} = \frac{0}{a}$$

$$x^2 + \frac{b}{a}x + \frac{c}{a} = 0$$

$$-\frac{c}{a} \qquad -\frac{c}{a}$$

$\frac{1}{2}\cdot\frac{b}{a}$

$$x^2 + \frac{b}{a}x + \frac{b^2}{4a^2} = -\frac{4ca}{4a\cdot a} + \frac{b^2}{4a^2}$$

$$\left(x + \frac{b}{2a}\right)^2 = -\frac{4ac}{4a^2} + \frac{b^2}{4a^2}$$

$\frac{3}{13}+\frac{5}{13}$

$\frac{3+5}{13}$

$\frac{8}{13}$

$$\left(x+\frac{b}{2a}\right)^2 = \frac{b^2-4ac}{4a^2}$$

$$\sqrt{\left(x+\frac{b}{2a}\right)^2} = \pm\sqrt{\frac{b^2-4ac}{4a^2}}$$

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

$$-\frac{b}{2a} \qquad -\frac{b}{2a}$$

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

Quadratic Formula $\quad x = \dfrac{-b \pm \sqrt{b^2-4ac}}{2a}$

(Solves $ax^2+bx+c=0$)

Apr 16-8:38 AM

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

Solve for $ax^2+bx+c=0$

Solve $x^2-5x=7$

$-7 \quad -7$

$x^2-5x-7=0$

$a=1$
$b=-5$
$c=-7$

$$x = \frac{5 \pm \sqrt{25-4(1)(-7)}}{2(1)}$$

$25+28$

$$x = \frac{5 \pm \sqrt{53}}{2}$$

2 real

Solve $16x^2-23x=17x-25$

$-17x+25 \quad -17x+25$

$16x^2-40x+25=0$

$(4x-5)^2=0$

$4x-5=0$

$+5 \quad +5$

$\frac{4x}{4}=\frac{5}{4}$

$x=\frac{5}{4}$

$16x^2-40x+25=0$

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a} = \frac{40 \pm \sqrt{1600-4(16)(25)}}{2(16)}$$

-1600

$a=16$
$b=-40$
$c=25$

$$= \frac{40 \pm \sqrt{0}}{32}$$

1 real solution

$$= \frac{40}{32} = \frac{5}{4}$$

Apr 16-8:47 AM

$x^2 - 6x + 10 = 0$ $a = 1$, $b = -6$, $c = 10$

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

$x = \frac{6 \pm \sqrt{36 - 4(1)(10)}}{2(1)} = \frac{6 \pm \sqrt{-4}}{2} = \frac{6 \pm 2i}{2}$ (-40)

$= \frac{6}{2} \pm \frac{2i}{2} = 3 \pm i$ 2 imag.

DISCRIMINANT:

$b^2 - 4ac$	solutions
+	2 real
0	1 real
−	2 imaginary

p. 62 (13–57) e00

Find discriminant and the number and types of solutions

a. $x^2 + 10x + 27 = 0$ $a = 1$, $b = 10$, $c = 27$

$b^2 - 4ac$

$100 - 4(1)(27)$

$100 - 108$

-8 2 imaginary

Apr 16-8:56 AM