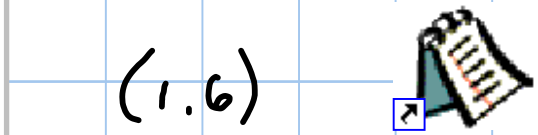
(1.6)



#37. $3x^2+2x+1=0$

$3x^2+2x = -1$

$x^2+\frac{2}{3}x+\frac{1}{9} = -\frac{1}{3}+\frac{1}{9}$

$\left(x+\frac{1}{3}\right)^2 = -\frac{2}{9}$ no solution

#33. $h^2+3h-1=0$

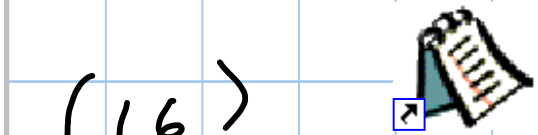
$h^2+3h+\frac{9}{4} = 1+\frac{9}{4}$

$\left(h+\frac{3}{2}\right)^2 = \frac{13}{4}$

$h+\frac{3}{2} = \frac{\pm\sqrt{13}}{2}$

$h = -\frac{3}{2} \pm \frac{\sqrt{13}}{2}$ $\quad h = \frac{-3\pm\sqrt{13}}{2}$

(1.6)



#45. $2x^2 - 3 = 0$

$a = 2 \quad b = 0 \quad c = -3$

$$x = \frac{0 \pm \sqrt{0 - 4(2)(-3)}}{4}$$

$$= \frac{\pm\sqrt{24}}{4} = \frac{\pm 2\sqrt{6}}{4}$$

$$= \frac{\sqrt{6}}{2}$$

#73. $x \cdot x = \left(1 + \frac{1}{x}\right) \cdot x$

$$x^2 = x + 1$$

$$x^2 - x - 1 = 0$$

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

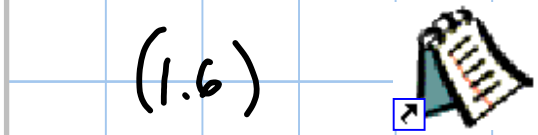
$$\left(x - \frac{1}{2}\right)^2 = \frac{5}{4}$$

$$x - \frac{1}{2} = \frac{\pm\sqrt{5}}{2}$$

$$x = \frac{1}{2} \pm \frac{\sqrt{5}}{2}$$

$$x = \frac{1 \pm \sqrt{5}}{2}$$

(1.6)



#65. $x^2 + 3x + 15 = 0$

$a = 1 \quad b = 3 \quad c = 15$

discriminant

$b^2 - 4ac$

$9 - 4(1)(15)$

$9 - 60$

-51

$\therefore$ no real solutions

(1.6)

#77. $\boxed{P = 40 - .001x}$ $\boxed{R = xP}$

$175000 = xP$

$\frac{175000}{x} = P$

$\frac{175000}{x} = 40 - .001x$

$R = 175{,}000$

$x \cdot \frac{175000}{x} = (40 - .001x) \cdot x$

$175000 = 40x - .001x^2$

$0 = \underset{a}{-.001x^2} + \underset{b}{40x} \underset{c}{- 175000}$

(1.7)

#13. $\frac{1}{2}x - 4 < \frac{1}{3}x + 5$

$\frac{1}{6}x - 4 < 5$

$\frac{1}{6}x < 9$

$x < 54$

#17. $\frac{2x-3}{-5} \geq 0$

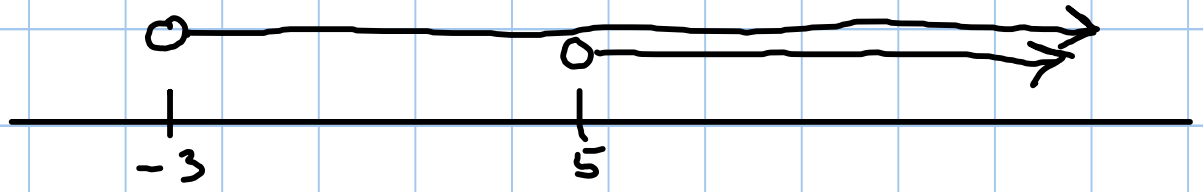
$2x - 3 \leq 0$

$2x \leq 3$

$x \leq \frac{3}{2}$

(1.7)

#29.



$\cup$

$(-3, \infty)$

(1.7)

#43.

$1 - x < 7 + x$

$1 < 7 + 2x$

$-6 < 2x$

$-3 < x$

OR

$\cup$

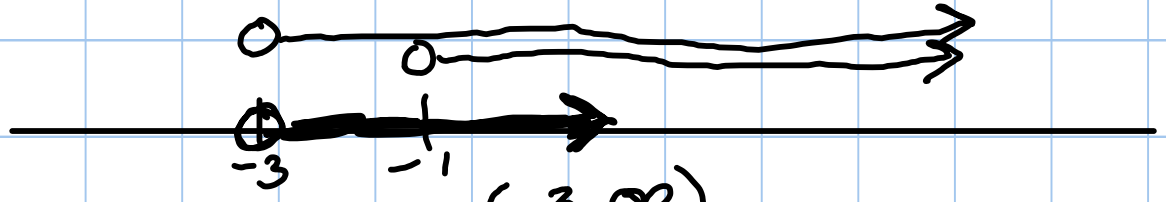
$4x + 3 > x$

$3x + 3 > 0$

$3x > -3$

$x > -1$

$\cup$



$(-3, \infty)$

(1.7)

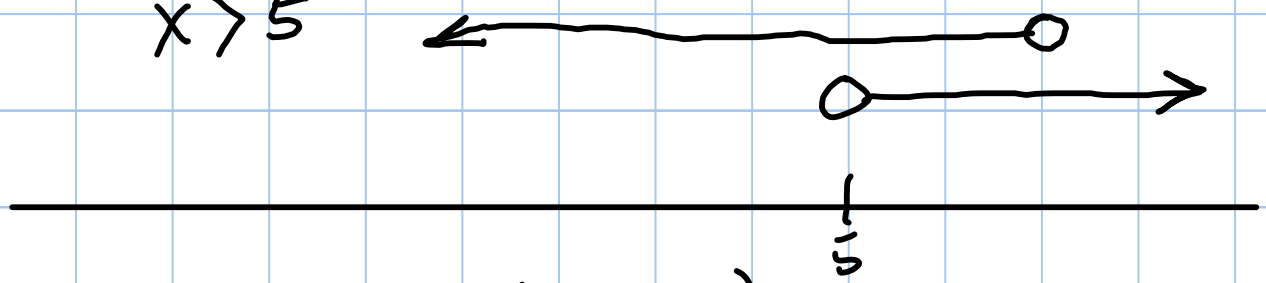
#45.

$\frac{1}{2}(x+1) > 3$ OR $0 < 7 - x$

$\frac{1}{2}x + \frac{1}{2} > 3$ (U) $x < 7$

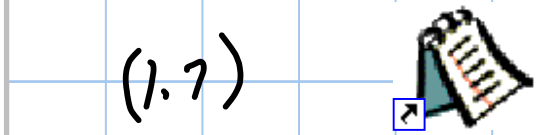
$\frac{1}{2}x > \frac{5}{2}$

$x > 5$



$(-\infty, \infty)$

(1.7)



|x| > OR ∪

|x| < AND ∩

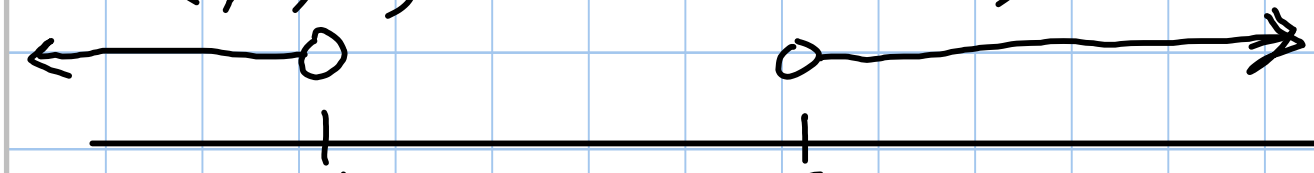
#61.

$$\left|\frac{x-3}{2}\right| > 1$$

$\frac{x-3}{2} > 1$ OR ∪ $\frac{x-3}{2} < -1$

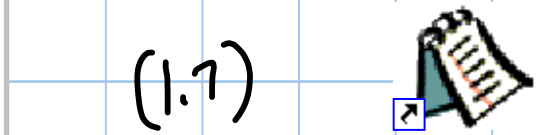
$x-3 > 2$ ∪ $x-3 < -2$

$(x > 5)$ ∪ $(x < 1)$



$(-\infty, 1) \cup (5, \infty)$

(1.7)



x : final exam
79 - 90

#87. $79 \le \frac{65+2x}{3} \le 90$

$79 \le \frac{65+2x}{3}$ ∩ $\frac{65+2x}{3} \le 90$

$237 \le 65+2x$

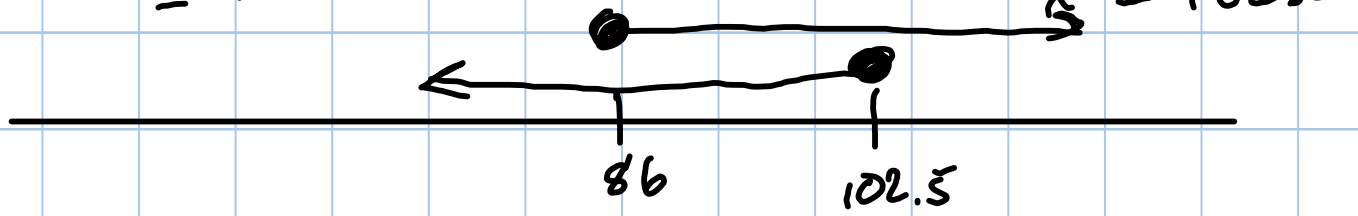
$172 \le 2x$

$86 \le x$

$65+2x \le 270$

$2x \le 205$

$x \le 102.5$



$[86, 102.5]$

P. 158

~~# 86~~

	$r \cdot t$	$=$	w
Burt	$\frac{1}{12}$	12	1
Mona	$\frac{1}{8}$	8	1

$12 \cdot r = 1$

$r = \frac{1}{12}$

$$\frac{1}{12} \cdot t + \frac{1}{8}(t-1) = 1$$

$$24\left(\frac{1}{12} \cdot t + \frac{1}{8}(t-1)\right) = 1 \cdot 24$$

$$2t + 3(t-1) = 24$$

$$2t + 3t - 3 = 24$$

$$5t - 3 = 24$$

$$5t = 27$$

$$t = \frac{27}{5} \text{ hrs.}$$

$\frac{2}{5} \cdot 60^{12}$

1:24 PM

P.157

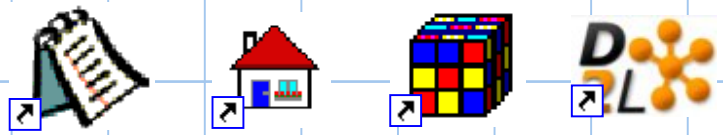
33. $2x - 3y = 6$

$-3y = -2x + 6$

$y = \frac{2}{3}x - 2$

49. $b^2 + 10 = 6b$

$b^2 - 6b + 10 = 0$



I had mentioned that college algebra students should be able to develop the quadratic formula starting from the general quadratic equation using the "completing the square" technique.

$ax^2+bx+c=0$ solve using "completing the square"

$ax^2+bx=-c$

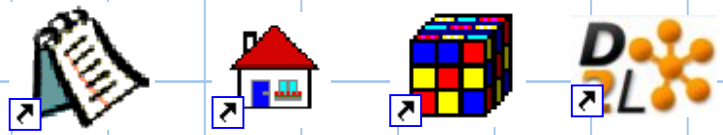
$x^2+\frac{b}{a}x+\frac{b^2}{4a^2}=-\frac{c}{a}\cdot\frac{4a}{4a}+\frac{b^2}{4a^2}$

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

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

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

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



some of the key memory items for this and later tests...

$$d = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$$

$$m = \frac{y_2-y_1}{x_2-x_1}$$

$y = mx + b$ m: slope ; b : y-intercept

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a} \qquad ax^2+bx+c=0$$

$$MP = \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$$

// lines have = slopes

⊥ lines have negative reciprocal slopes

$(x-h)^2 + (y-k)^2 = r^2$ center (h,k) radius : r

standard form for a circle

$x^2 + 3x + y^2 = 5y - 1$

given this equation, find the center and radius of the circle.

$x^2 + 3x + \frac{9}{4} + y^2 - 5y + \frac{25}{4} = -1 + \frac{9}{4} + \frac{25}{4}$

$(x + \frac{3}{2})^2 + (y - \frac{5}{2})^2 = \frac{30}{4}$

center $(-\frac{3}{2}, \frac{5}{2})$

radius: $\frac{\sqrt{30}}{2}$