Math 100 Winter 2012 Assignment 2 SOLUTIONS

7.2 24, 40, 74
8.2 14, 58
8.1 22
8.3 8, 28, 30, 36, 60, 64, 74a-e

7.2 24 Let x = number of wins (4)
Let y = number of losses

$x+y = 82$ $\quad x = 3y-2$

$\rightarrow x = 82-y$ substitute: $82-y = 3y-2$

$\Rightarrow 82+2 = 3y+y \Rightarrow 84 = 4y \Rightarrow 21 = y$

$x = 82-21 = 61$

check: total $x+y = 21+61 = 82$ ✓

wins $61 = 3(21)-2$ ✓

Answer - they won 61 games and lost 21

40. 3 gallons ~~of~~ 4% add water to get 3% (4)

Let x = amount of water added

strength	amt of liquid	amt of chemical
4%	3	$(3)(.04) = .12$
0%	x	0
3%	$3+x$	$.03(3+x) = .12+0$

$.03(3+x) = .12$

$\rightarrow .09 + .03x = .12$

$.03x = .12 - .09 = .03$

$x = \frac{.03}{.03} = 1$

Should add 1 gallon of water

check: total is $3+1 = 4$ gallons

amt of chemical $= .12 = 3\%$ of 4 ✓

74. Bike 15 min = 1/4 hr
Walk 45 min = 3/4 hr

(2)

Let v = speed of walking
$\rightarrow v+10$ = speed of biking

(4)

distance is the same $d = vt$

$$(v)(3/4) = (v+10)(1/4)$$
walk bike

$$\Rightarrow \frac{3}{4}v = \frac{v}{4} + \frac{10}{4} \Rightarrow 4\left(\frac{3}{4}\right)v = 4\left(\frac{v}{4}\right) + 4\left(\frac{10}{4}\right)$$

$$\Rightarrow 3v = v + 10$$

$$\Rightarrow 2v = 10 \Rightarrow v = 5$$

$$d = v(3/4) = 5(3/4) = \boxed{\frac{15}{4} \text{ miles}}$$

check: walking $5(3/4) = \frac{15}{4}$
biking $15(\frac{1}{4}) = \frac{15}{4}$

(2)

8.1 22 $(-2,1)$ and $(3,-2)$

distance $d = \sqrt{(-2-3)^2 + (1--2)^2} = \sqrt{(-5)^2+(3)^2} = \sqrt{25+9}$
$= \sqrt{34}$

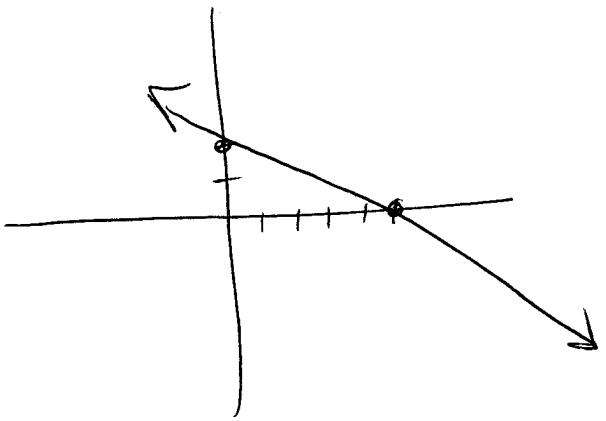
midpoint $\left(\frac{-2+3}{2}, \frac{1-2}{2}\right) = \left(\frac{1}{2}, \frac{-1}{2}\right)$

5.2 14 $2x+5y=10$

$x=0 \Rightarrow 5y=10$
$y=2$

$y=0 \Rightarrow 2x=10$
$x=5$

(2)



58. L_1 through $(9,15)$ & $(-7,12)$ (3)

has slope $m = \frac{15-12}{9--7} = \frac{3}{16}$

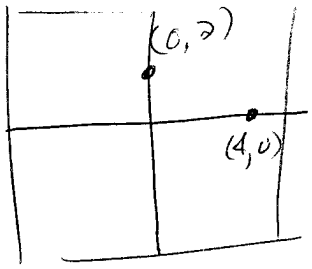
(2)

L_2 through $(-4,8)$ & $(-20,5)$

has slope $m = \frac{8-5}{-4--20} = \frac{3}{16}$

Same slopes so lines are <u>parallel</u>

8.3 8.

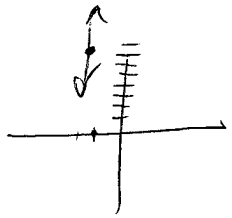


$m = \frac{2-0}{0-4} = \frac{-1}{2}$ (2)

$y = -\frac{1}{2}x + 2$

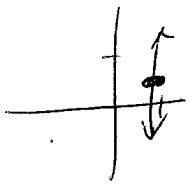
28 Through $(-2,8)$ undefined slope (1)

$x = -2$



30 Through $\left(\frac{5}{8}, \frac{2}{9}\right)$; vertical (1)

$x = 5/8$



36. $(-2,5)$ & $(-8,1)$

$m = \frac{5-1}{-2--8} = \frac{4}{6} = \frac{2}{3}$

$y = mx+b$

$\rightarrow 5 = \frac{2}{3}(-2)+b$ (2)

$b = 5 + \frac{4}{3} = \frac{15+4}{3} = \frac{19}{3}$

so $y = \frac{2}{3}x + \frac{19}{3}$

60 Through (4, 1) parallel to $2x+5y=10$ (4)

$2x+5y=10 \Rightarrow 5y=-2x+10 \Rightarrow y=-\frac{2}{5}x+2$

has slope $-\frac{2}{5}$ parallel lines have same slope

(2)

$y-1=-\frac{2}{5}(x-4)=-\frac{2}{5}x+\frac{8}{5} \Rightarrow y=-\frac{2}{5}x+\frac{8}{5}+1$

$\boxed{y=-\frac{2}{5}x+\frac{13}{5}}$

64. Through (2, -7) $\perp$ to $5x+2y=18$

$5x+2y=18 \Rightarrow 2y=18-5x=-\frac{5}{2}x+9 \quad m=-\frac{5}{2}$

$\perp$ lines have negative reciprocal slopes (2)

so $m=\frac{-1}{-5/2}=\frac{2}{5}$

$y--7=\frac{2}{5}(x-2) \rightarrow y+7=\frac{2x}{5}-\frac{4}{5} \rightarrow y=\frac{2}{5}x-\frac{4}{5}-7$

$\boxed{y=\frac{2}{5}x-\frac{39}{5}}$

74. a) When $C=0°$, $F=32°$ & when $C=100°$, $F=212$

b) (0, 32) & (100, 212)

c) $m=\frac{212-32}{100-0}=\frac{180}{100}=\frac{9}{5}$ (3)

d) $F=\frac{9}{5}C+32$

e) Solve for C in terms of F

$\frac{9}{5}C=F-32 \rightarrow C=\frac{5}{9}(F-32)$

$=\frac{5}{9}F-\frac{160}{9}$