146/141 Sample 1 Solutions

1) $\frac{5 \times 64 - 32(-3)}{8 \times 2} = \frac{320 + 96}{16} = \frac{416}{16} = 26$

2) a) $\frac{24}{\sqrt{6}} \cdot \frac{\sqrt{6}}{\sqrt{6}} = \frac{24\sqrt{6}}{6} = 4\sqrt{6}$

b) $3\sqrt{3} - 5 \cdot 3\sqrt{3} + 8 \cdot 5\sqrt{3}$

$3\sqrt{3} - 15\sqrt{3} + 40\sqrt{3} = 28\sqrt{3}$

3) $\frac{a^6 a^{-3}}{a^8} = \frac{a^3}{a^8} = \frac{1}{a^5}$

4) $\frac{\left(1 - \frac{4}{y^2}\right) y^2}{\left(1 - \frac{1}{y} - \frac{6}{y^2}\right) y^2} = \frac{y^2 - 4}{y^2 - y - 6} = \frac{(y-2)(y+2)}{(y-3)(y+2)} = \frac{y-2}{y-3}$

5) $t^3 - 64 = (t-4)(t^2 + 4t + 16)$

6) $6a^3 - 4a^2 + 15a - 10$

$2a(3a-2) + 5(3a-2)$

$(3a-2)(2a+5)$

7) a) $f(-2) = (-2)^2 - 5$

$= 4 - 5$

$= -1$

b) $f(g(8))$ do $g(8)$ first, then $f(\ )$ the answer

$f\left(\frac{8}{2}\right)$

$f(4) = 4^2 - 5 = 16 - 5 = 11$

8) $y = x^2 - 6x + 8$ parabola ∪

vertex $\left(-\frac{b}{2a}, \quad\right)$

$\left(\frac{6}{2}, \quad\right)$

vertex $(3, -1)$

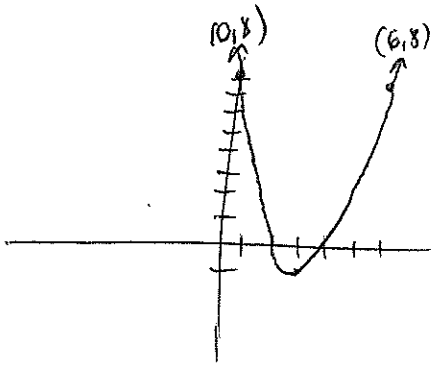
$3^2 - 6(3) + 8$

$9 - 18 + 8$

$-9 + 8$

-1

x	y
0	8
6	8



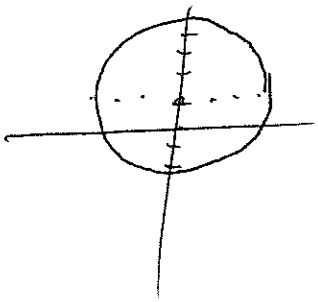
9) $x^2 + y^2 - 2y = 8$ circle

$x^2 + y^2 - 2y + 1 = 8 + 1$

$x^2 + (y-1)^2 = 9$

center $(0, 1)$

radius 3



10) $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{12-3}{1--2} = \frac{9}{3} = 3$

$y - 12 = 3(x-1)$

$y - 12 = 3x - 3$

$y = 3x + 9$

11) $.4a - .1 = .7 - 1.8 + .6a$

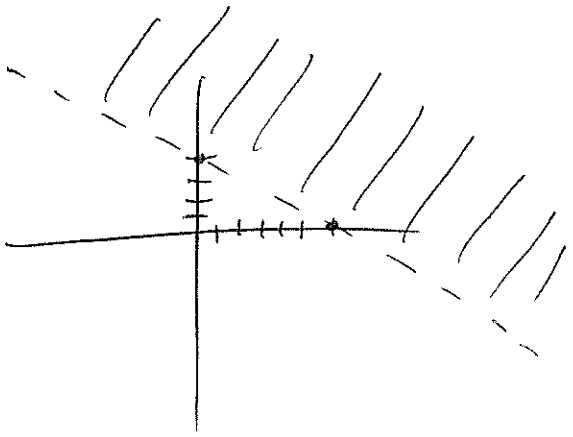
$1 = .2a$

$5 = a$

12) $2x+3y>12$

x	y
0	4
6	0

$0>12$ False



13) $2t^2-7t-15=0$

$(2t \quad 5)(t \quad 3)$

$2t^2$ $6t$ $5t$ IS

$(2t+3)(t-5)=0$

$2t+3=0$ $\quad t-5=0$

$2t=-3$ $\quad t=5$

$t=-\frac{3}{2}$

14) $x^2-8x+16=-13+16$

$\sqrt{(x-4)^2}=\sqrt{3}$

$x-4=\pm\sqrt{3}$

$x=4\pm\sqrt{3}$

15) $\left(\frac{y}{2}+\frac{4}{y-4}=\frac{y}{y-4}\right)\ 2(y-4)$

$y(y-4)+4(2)=2y$

$y^2-4y+8=2y$

$y^2-6y+8=0$

$(y-2)(y-4)=0$

$y-2=0$ $\quad y-4=0$

$y=2$ $\quad y=4$

$y\neq 4$

check

$\boxed{y=2}$

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

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

$0 = x^2 - 7x$

$0 = x(x-7)$

$0 = x \qquad x-7=0$

$x=7$

check

$x \neq 0$

$\sqrt{3(0)+4} = 0-2$

$2 = -2$

No

$\boxed{x=7}$

$\sqrt{3(7)+4} = 7-$

$\sqrt{25} = 5$

$5=5$

Yes!

17) $(3x+y=3) \quad \times 2$

$x-2y=8$

$6x+2y=6$

$x-2y=8$

$7x = 14$

$x=2$

$2-2y=8$

$-6=2y$

$-3=y$

$\boxed{(2,-3)}$

check $6-3=3$ ✓

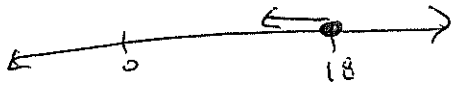
$2+6=8$ ✓

18) $\left(4 - \frac{5}{6}y \geq -11\right) 6$

$24 - 5y \geq -66$

$-5y \geq -90$

$y \leq 18$

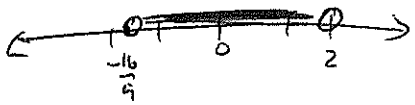


19) $|9x-1| < 17$

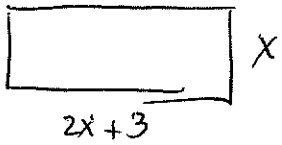
$9x-1 < 17 \qquad 9x-1 > 17$

$9x < 18 \qquad 9x > -16$

$x < 2 \qquad x > \frac{-16}{9}$



20)



$P = 2L + 2W$

$21 = 2(x) + 2(2x+3)$

$21 = 2x + 4x + 6$

$\frac{15}{6} = \frac{6x}{6}$

$\frac{15}{6} = x$

$2\left(\frac{15}{6}\right) + 3$

$\frac{15}{3} + \frac{3}{1}$

$5 + 3 = 8$

length = 8 ft

width = $\frac{15}{6}$ ft

21)

$(2x+3)(3x-1)(x+2)$

$(6x^2 - 2x + 9x - 3)(x+2)$

$(6x^2 + 7x - 3)(x+2)$

$6x^3 + 7x^2 - 3x + 12x^2 + 14x - 6$

$6x^3 + 19x^2 + 11x - 6$

22)

$$\begin{array}{r} 4x-7 \\ x+3 \overline{)\,4x^2+5x+4} \\ -(4x^2+12x) \\ \hline -7x+4 \\ +7x+21 \\ \hline 25 \end{array}$$

$4x - 7 + \frac{25}{x+3}$

23) $.06(x+900) + .09(x) = 303$

$.06x + 48 + .09x = 303$

$.15x = 255$

$x = 1700$

$1700 in 9%
$2500 in 6%

24) $\frac{(5+i)(1-i)}{(1+i)(1-i)} = \frac{5-5i+1i-i^2}{1-i^2} = \frac{5-4i+1}{1--1} = \frac{6-4i}{2} = 3-2i$

25) $x+y=50$

$.4x+.5y=.46(50)$

$x+y=50$

$40x+50y=2300$

$x-40$

$-40x-40y=-2000$

$40x+50y=2300$

$10y=300$

$y=30$

30 liters of 50%
20 liters of 40%.