pg. 45

#105

#3) $f(0)=6$ $f(2)=18$ $f(4)=34$

$(0,6)$ $(2,18)$ $(4,34)$

$$ax^2+bx+c=y$$

1) $0a+0b+c=6$

2) $4a+2b+c=18$

3) $16a+4b+c=34$

$c=6$

$4a+2b+6=18$

$16a+4b+6=34$

$4a+2b=12$

$16a+4b=28$

$-8a-4b=-24$

$16a+4b=28$

$8a=4$

$a=\frac{1}{2}$

$4(\frac{1}{2})+2b=12$

$2b=10$

$b=5$

$f(x)=\frac{1}{2}x^2+5x+6$

p.45

#8)

3	4	5
70	85	80

(1) $9a + 3b + c = 70$

(2) $16a + 4b + c = 85$

(3) $25a + 5b + c = 80$

3−2: $9a + b = -5$

1−2: $-7a - b = -15$

$2a = -20$

$a = -10$

$9(-10) + b = -5$

$-90 + b = -5$

$b = 85$

$9(-10) + 3(85) + c = 70$

$c = -95$

$f(x) = -10x^2 + 85x - 95$

c) find max (vertex)

$x = -\frac{b}{2a} = \frac{-85}{2(-10)} = 4.25$

$Y = -10(4.25)^2 + 85(4.25) - 95$

$Y = -180.625 + 361.25 - 95$

$Y = 85.625$

$4\frac{1}{4}$ bags will maximize profit at $ 85.63

p.45

#11)

a) $h(t) = -4.9t^2 + 14t + 30$

b) max. $t = \frac{-14}{2(-4.9)} = \frac{10}{7}$ sec.

c) $0 = -4.9t^2 + 14t + 30$

$$t = \frac{-14 \pm \sqrt{196 - 4(-4.9)(30)}}{2(-4.9)}$$

$$t = \frac{-14 \pm \sqrt{784}}{-9.8}$$

$t = -1.429$

$t \approx 4.2857$ seconds later

$\left(\frac{30}{7}\right)$ seconds

p.50

#1) $A:(-2,-6)$, $B:(-4,2)$

a) $d = \sqrt{(-4+2)^2 + (2+6)^2} = \sqrt{4+64} = \sqrt{68} = 2\sqrt{17}$

b) $\left(\frac{-2+-4}{2}, \frac{-6+2}{2}\right) \Rightarrow \left(\frac{-6}{2}, \frac{-4}{2}\right) \Rightarrow (-3,-2)$

#2) $(4,-2)$ on the line $2x+ay=14$

$2(4)+a(-2)=14$

$-2a=6$

$a=-3$

#3) ① $2x+3y=2$

② $6x-y=-4$

$2x+3y=2$

$18x-3y=-12$

$20x = -10$

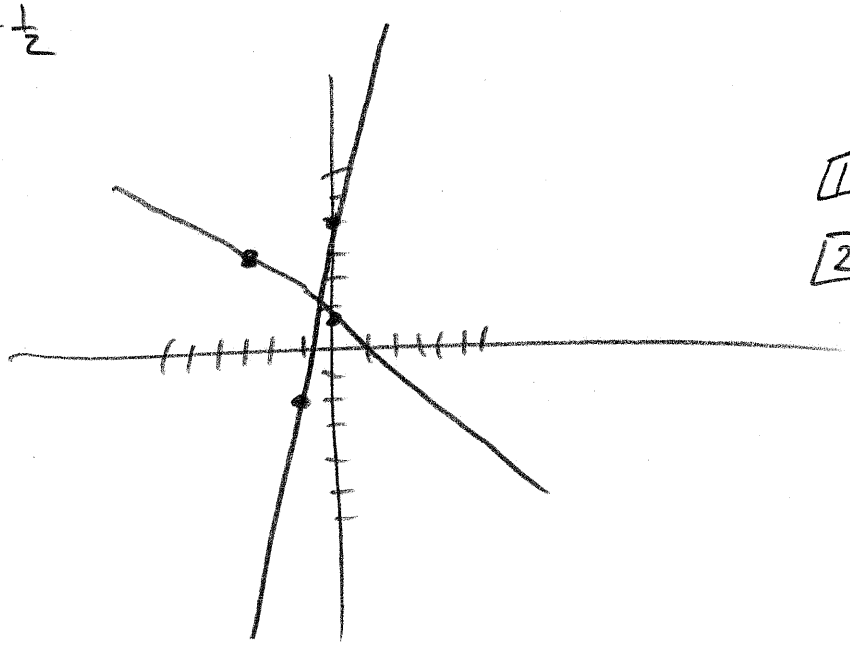
$x=-\frac{1}{2}$

$2(-\frac{1}{2})+3y=2$

$3y=3$

$y=1$

$(-\frac{1}{2}, 1)$



① $y=-\frac{2}{3}x+\frac{2}{3}$

② $y=6x+4$

p.50

#4) $4x - 2y = 7$

$-2y = -4x + 7$

$y = 2x - \frac{7}{2}$

slope: 2

y-int: $-\frac{7}{2}$

#5) a) $2x + 3y = 1$ $\quad m = -\frac{2}{3}$

b) $y = \frac{3}{2}x + 3$ $\quad m = \frac{3}{2}$

c) $6x - 4y - 10 = 0$ $\quad m = \frac{6}{4} = \frac{3}{2}$

$b \parallel c$, $a \perp b$, $a \perp c$

#6) $(6, -2)$ $(-3, 1)$

$m = \frac{1+2}{-3-6} = \frac{3}{-9} = -\frac{1}{3}$

$y - 1 = -\frac{1}{3}(x + 3)$

$y - 1 = -\frac{1}{3}x - 1$

$y = -\frac{1}{3}x$

$3y = -x$

$x + 3y = 0$

#7) through $(5, 5)$

and $\parallel$ to $4x + 3y = -2$

$m = -\frac{4}{3}$

$y - 5 = -\frac{4}{3}(x - 5)$

$3y - 15 = -4x + 20$

$4x + 3y = 35$

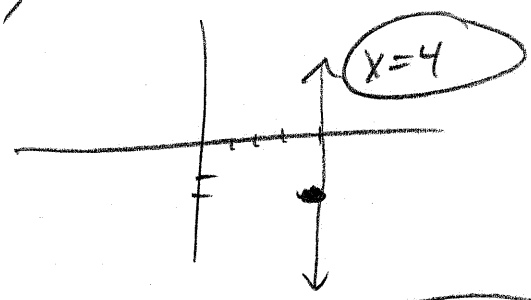
#8) x-int: -3 $\quad$ y-int: -5

$\frac{x}{-3} + \frac{y}{-5} = 1$

$5x + 3y = -15$

p. 2 of 1

#9) vert. line through (4, -2)



10a) 1) find the midpoint.

2) find the slope

3) change the slope to negative reciprocal

4) use parts 1) and 3) to get the equation of the line.

10b) (7, 0) (1, 8)

1) $\left(\frac{7+1}{2}, \frac{0+8}{2}\right) \Rightarrow \left(\frac{8}{2}, \frac{8}{2}\right) \Rightarrow (4, 4)$

2) $m = \frac{8-0}{1-7} = \frac{8}{-6} = -\frac{4}{3}$

3) $\perp m = \frac{3}{4}$

4) $y - 4 = \frac{3}{4}(x - 4)$

$4y - 16 = 3x - 12$

$-3x + 4y = 4$

$3x - 4y = -4$

p.50

#12) $\sqrt{-50} - \sqrt{-8}$

$5i\sqrt{2} - 2i\sqrt{2}$

$3i\sqrt{2}$

#13) $(2+3i)^2$

$(2+3i)(2+3i)$

$4 + 6i + 6i + 9i^2$

$-5 + 12i$

#14) $\frac{1}{2+3i} \cdot \frac{2-3i}{2-3i} = \frac{2-3i}{4-9i^2} = \frac{2-3i}{13} = \frac{2}{13} - \frac{3}{13}i$

#15) $\frac{\sqrt{3}+i}{\sqrt{3}-i} \cdot \frac{\sqrt{3}+i}{\sqrt{3}+i} = \frac{3 + i\sqrt{3} + i\sqrt{3} + i^2}{3 - i^2}$

$= \frac{3 + 2i\sqrt{3} - 1}{3+1} = \frac{2+2i\sqrt{3}}{4} = \frac{1+i\sqrt{3}}{2} = \frac{1}{2} + \frac{\sqrt{3}}{2}i$

#16) $4(3+2i) - 5(1-i)$

$12 + 8i - 5 + 5i$

$7 + 13i$

#17) i^{17}

$4\overline{)17}^{\,4(r1)}$

$= i^1 = i$

#18a) $7x^2 - 2 = 5x$

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

$7x \quad + 2$

$x \quad - 1$

$(7x+2)(x-1) = 0$

$x = -\frac{2}{7}, \; x = 1$

18b) $x^2 + 4x = 9$

$x^2 + 4x + 4 = 9 + 4$

$(x+2)^2 = 13$

$x + 2 = \pm\sqrt{13}$

$x = -2 \pm \sqrt{13}$

18c) $x^2 + 2x + 2 = 0$

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

$x = \frac{-2 \pm \sqrt{-4}}{2}$

$x = \frac{-2 \pm 2i}{2}$

$x = -1 \pm i$

(p. 3)

#19) $3x^2 - 2x + 2 = 0$

discriminant: $b^2 - 4ac$

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

$4 - 24$

$-20 \Rightarrow$ 2 imaginary solutions

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

$$x = \frac{2 \pm \sqrt{-20}}{6}$$

$$x = \frac{2 \pm 2i\sqrt{5}}{6}$$

$$x = \frac{1 \pm i\sqrt{5}}{3}$$

$$x = \frac{1}{3} \pm \frac{\sqrt{5}}{3} i$$

(p. 5)

#20 a) $y = 8 - 2(x-1)^2$

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

Vertex: $(1, 8)$

A.O.S.: $x = 1$

y-int: ($x=0$)

$y = -2(0-1)^2 + 8$

$y = 6$

$(0, 6)$

x-int: ($y=0$)

$0 = -2(x-1)^2 + 8$

$-8 = -2(x-1)^2$

$4 = (x-1)^2$

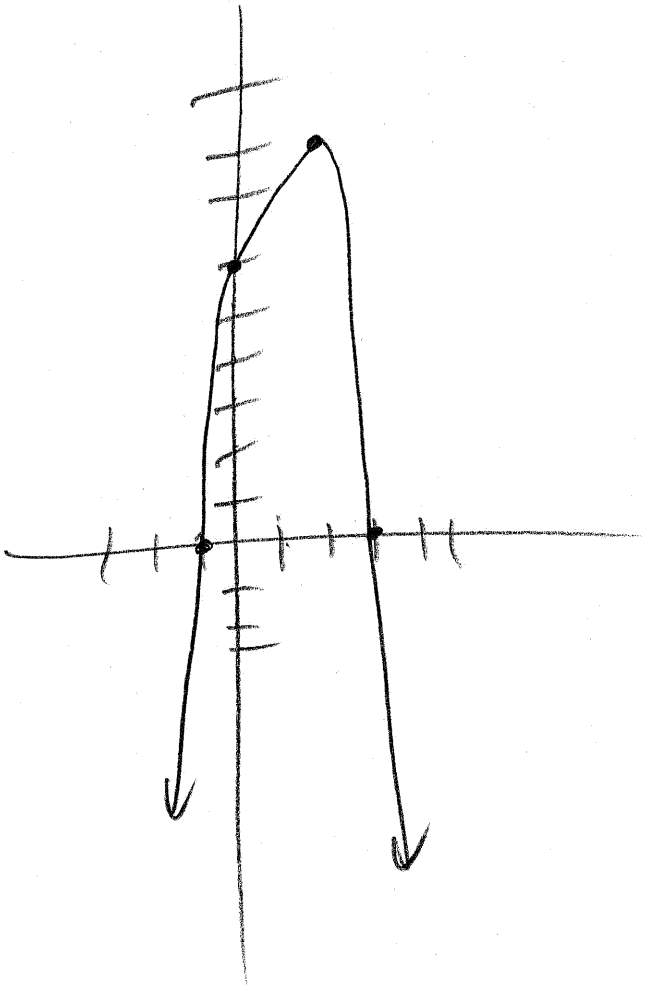
$\pm\sqrt{4} = x - 1$

$\pm 2 = x - 1$

$2 = x - 1$ $\quad -2 = x - 1$

$x = 3$ $\quad x = -1$

x-int: $3, -1$



p.50

#20 b) $y = x^2 - 6x + 5$

Vertex: $x = \frac{-b}{2a} = \frac{-(-6)}{2(1)} = 3$

$y = 3^2 - 6(3) + 5$

$y = 9 - 18 + 5$

$y = -4$

$(3, -4)$

A.O.S.: $x = 3$

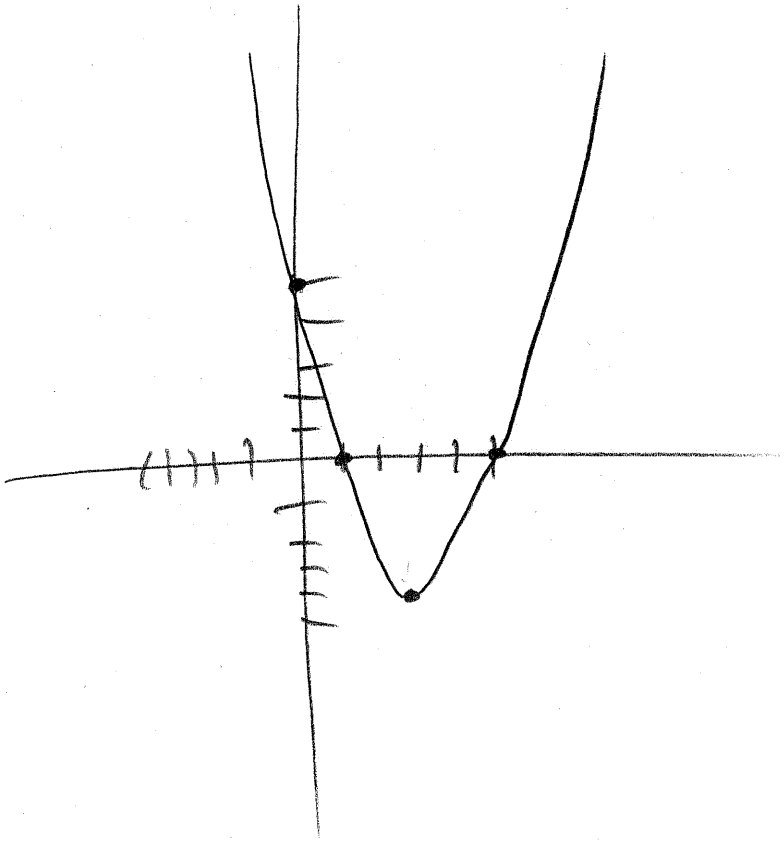
y-int: $y = 5$

($x = 0$) $(0, 5)$

x-int: $0 = x^2 - 6x + 5$

($y = 0$) $0 = (x - 5)(x - 1)$

$x = 5, \; x = 1$



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#21) [1] $2x - y = -2$ $\quad y = 2x + 2$

[2] $y = -x^2 + 4x + 1$

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

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

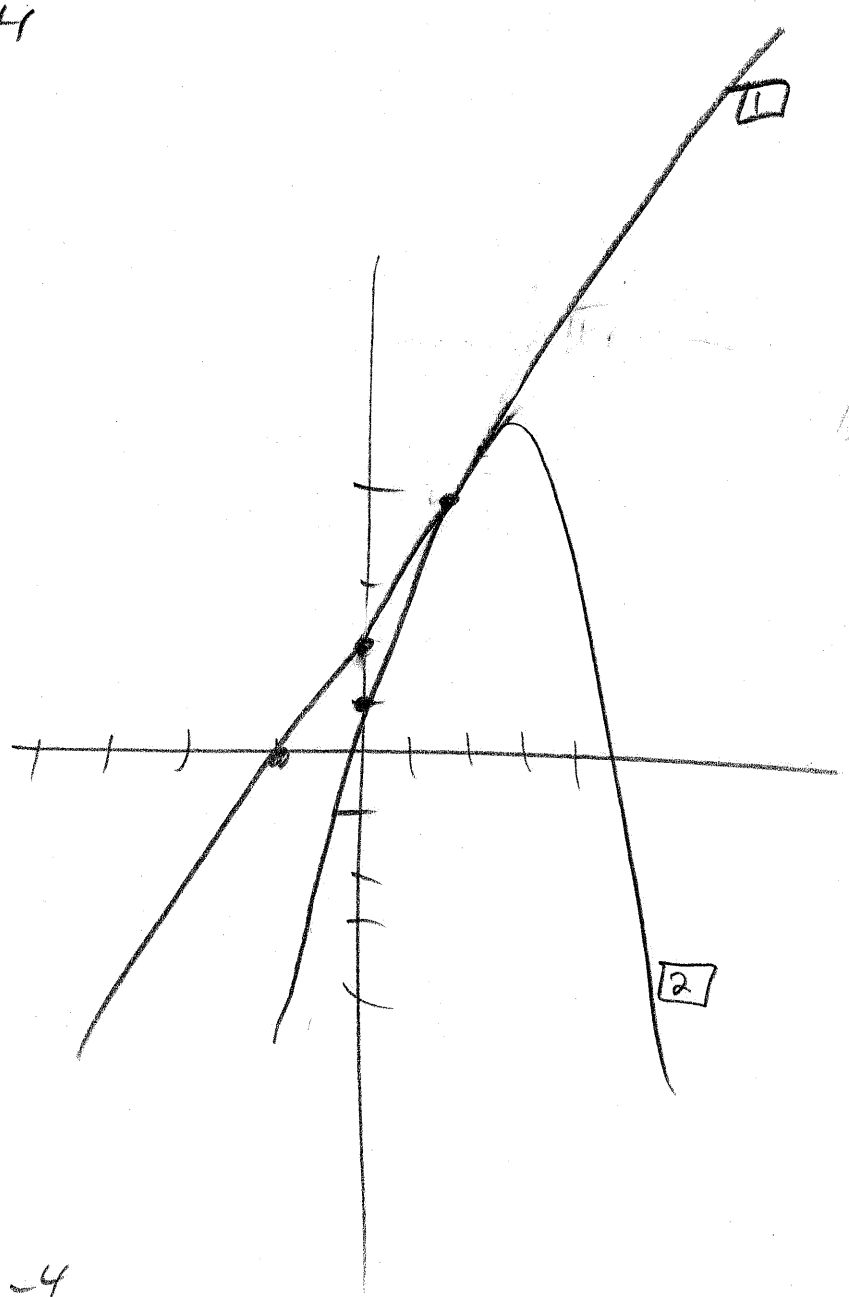
$(x-1)(x-1) = 0$

$x = 1$

$y = (2)(1) + 2$

$y = 4$

$(1, 4)$



2] vertex: $x = \frac{-4}{2(-1)} = \frac{-4}{-2} = 2$

$y = -4 + 8 + 1$

$y = 5$ $\quad (2, 5)$