

#3) $y = (x+5)(x+3)$

x-int: $-5, -3$

y-int: $y = (0+5)(0+3)$
 $= 15$
 $(0, 15)$

vertex: $x = \frac{(-5) + (-3)}{2} = -4$

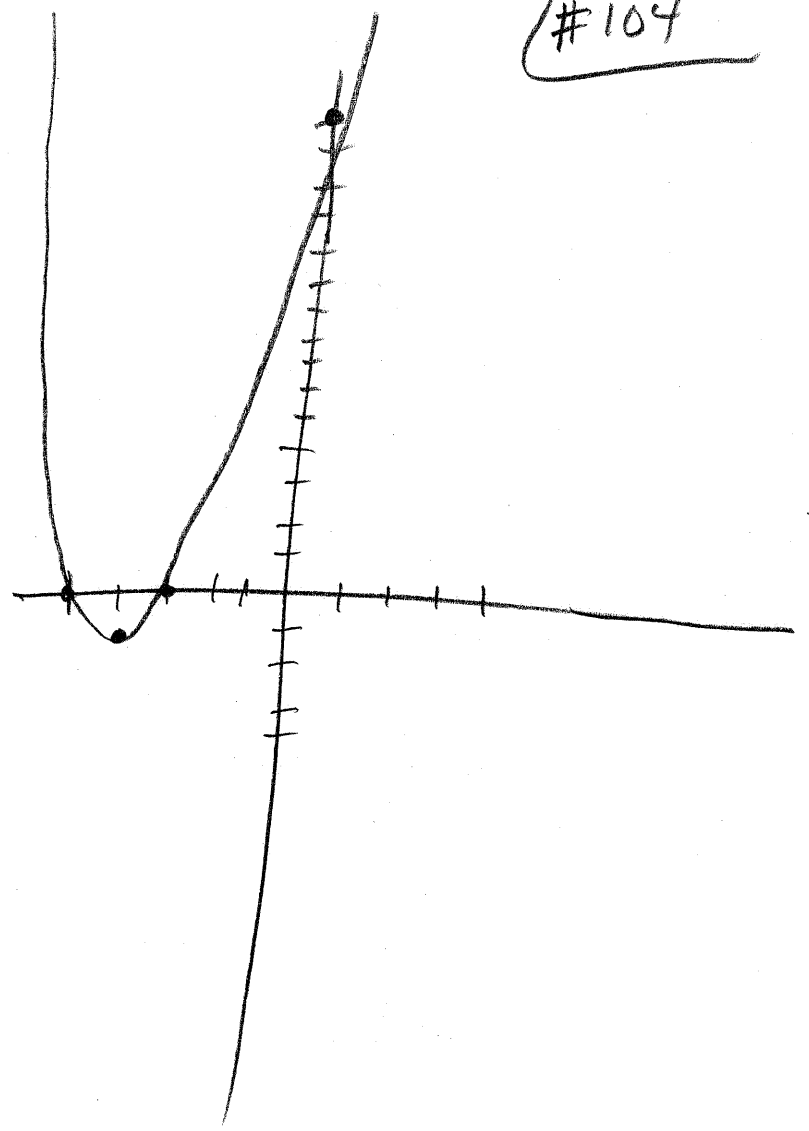
$y = (-4+5)(-4+3)$

$y = (1)(-1)$

$y = -1$

vertex: $(-4, -1)$

AOS: $x = -4$



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$$\#11) \quad y = 4x^2 - 8x + 2$$

$$\text{vertex: } x = \frac{-b}{2a}, \quad x = \frac{-(-8)}{2(4)}, \quad x=1$$

$$y = 4(1)^2 - 8(1) + 2$$

$$y = 4 - 8 + 2$$

$$y = -2$$

$$(1, -2)$$

$$\text{AOS: } x=1$$

$$y\text{-int: } y=2$$

$$(x=0)$$

$$(0, 2)$$

$$x\text{-int.: } 0 = 4x^2 - 8x + 2$$

$$(y=0)$$

$$0 = 2(2x^2 - 4x + 1)$$

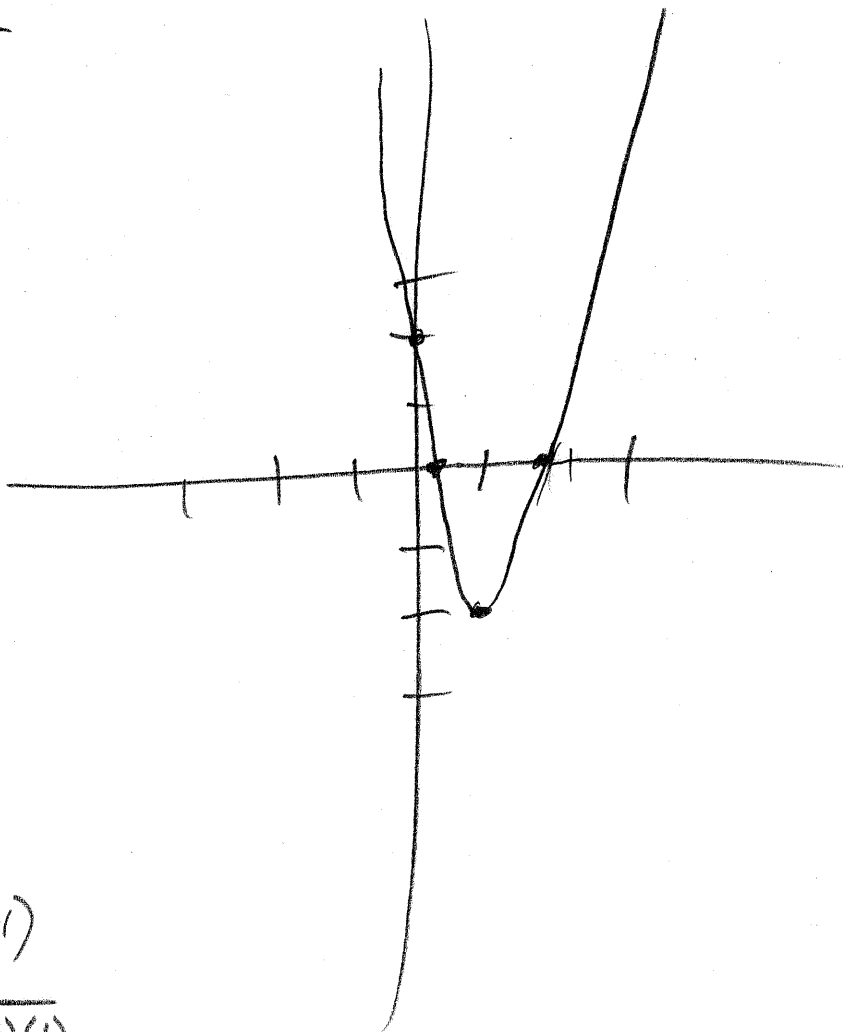
$$x = \frac{4 \pm \sqrt{16 - 4(2)(1)}}{2(2)}$$

$$x = \frac{4 \pm \sqrt{8}}{4}$$

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

$$x = \frac{2 \pm \sqrt{2}}{2} \rightarrow 1.707$$

$$\rightarrow 0.293$$



(p.41)

#17) $y = x^2 + 2x + 17$

vertex: $x = \frac{-b}{2a} = \frac{-2}{2(1)} = -1$

$y = (-1)^2 + 2(-1) + 17$

$y = 1 - 2 + 17$

$y = 16$

$(-1, 16)$

AoS: $x = -1$

y-int: $y = 17$

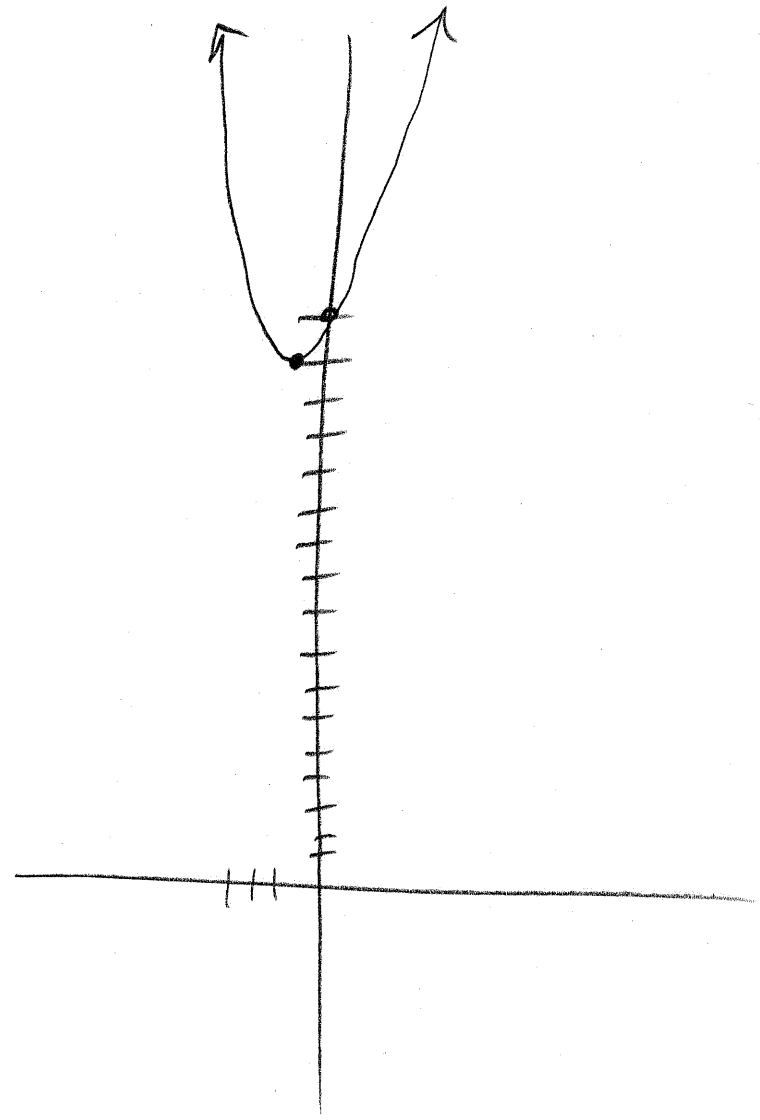
$(x=0)$ $(0, 17)$

x-int: $0 = x^2 + 2x + 17$

$y=0$
 $x = \frac{-2 \pm \sqrt{4 - 4(1)(17)}}{2(1)}$

$x = \frac{-2 \pm \sqrt{-64}}{2}$

no x-intercepts



#18) $y = 2(x+3)^2 + 6$

vertex: $(-3, 6)$

AOS. $x = -3$

y-int: $y = 2(0+3)^2 + 6$

(k=0) $y = 18 + 6$

$y = 24$

$(0, 24)$

x-int: $0 = 2(x+3)^2 + 6$

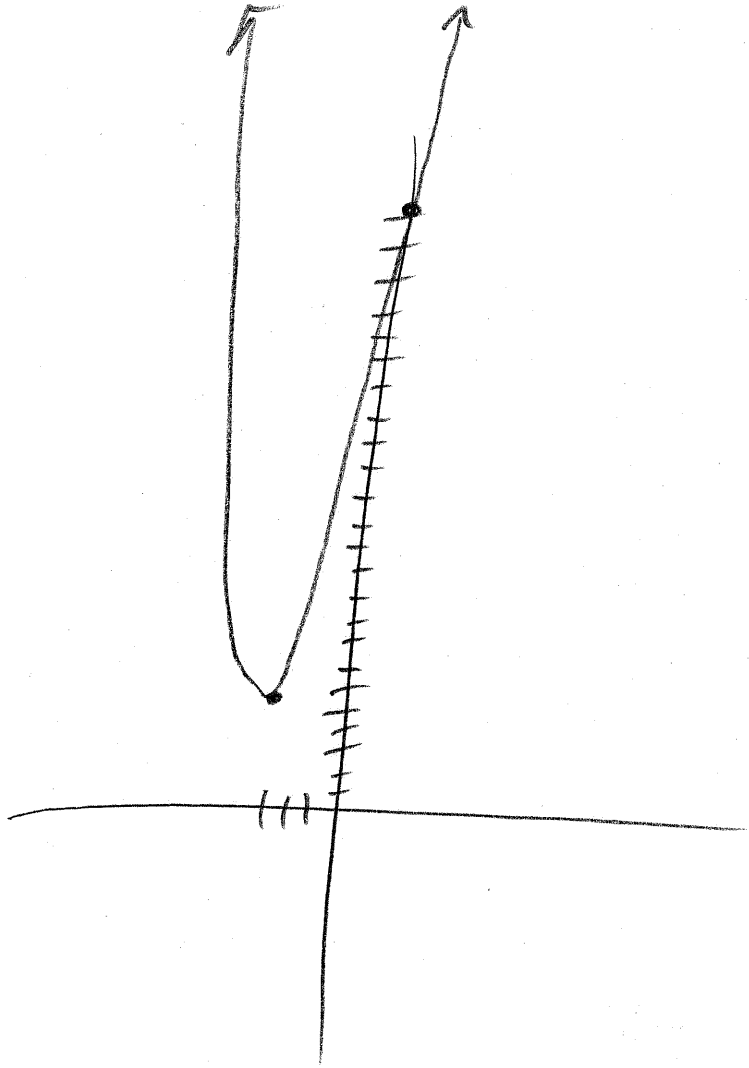
(y=0)

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

$-3 = (x+3)^2$

Not possible

no x-intercept



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#23)

1

$$y + x = -6$$

$$y = -x - 6$$

2

$$y = x^2 + 6x$$

$$y = x(x+6)$$

using substitution

$$-x - 6 = x^2 + 6x$$

$$0 = x^2 + 7x + 6$$

$$0 = (x+6)(x+1)$$

$$x = -6$$

$$x = -1$$

$$y = -(-6) - 6$$

$$y = -(-1) - 6$$

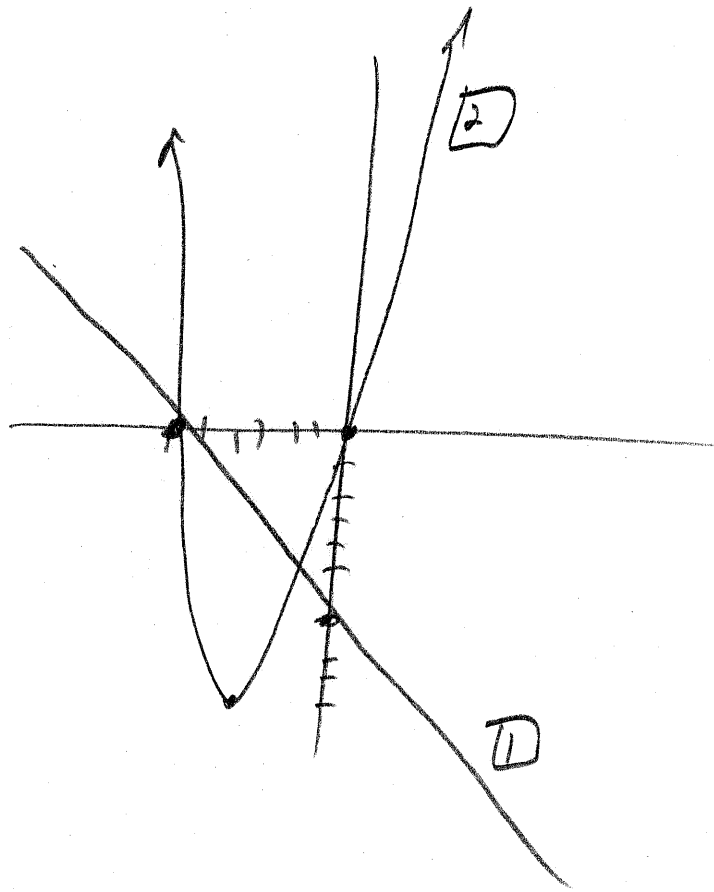
$$y = 6 - 6$$

$$y = 1 - 6$$

$$y = 0$$

$$y = -5$$

$(-6, 0)$, $(-1, -5)$



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#27) x -int: 2 and -1 y -int: 6

(0, 6)

$$y = a(x-2)(x+1)$$

$$6 = a(0-2)(0+1)$$

$$6 = a(-2)(1)$$

$$6 = -2a$$

$$a = -3$$

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

$$y = -3(x^2 - x - 2)$$

$$f(x) = -3x^2 + 3x + 6$$

#29) vertex (4, 8)

Point: origin (0, 0)

$$y = a(x-4)^2 + 8$$

$$0 = a(0-4)^2 + 8$$

$$-8 = 16a$$

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

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

$$y = -\frac{1}{2}(x^2 - 8x + 16) + 8$$

$$y = -\frac{1}{2}x^2 + 4x - 8 + 8$$

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

(p. 41)

#31) Minimum $f(3) = -5$
(vertex) : $(3, -5)$

and $f(1) = 2$
point : $(1, 2)$

$$y = a(x-3)^2 - 5$$

$$2 = a(1-3)^2 - 5$$

$$7 = 4a$$

$$a = \frac{7}{4}$$

$$y = \frac{7}{4}(x-3)^2 - 5$$

$$f(x) = \frac{7}{4}(x-3)^2 - 5$$

OR

$$f(x) = \frac{7}{4}(x^2 - 6x + 9) - 5$$

$$f(x) = \frac{7}{4}x^2 - \frac{21}{2}x + \frac{63}{4} - \frac{20}{4}$$

$$f(x) = \frac{7}{4}x^2 - \frac{21}{2}x + \frac{43}{4}$$

#32)

max $f(-1) = 6$

vertex : $(-1, 6)$

$$y = a(x+1)^2 + 6$$

$$4 = a(-3+1)^2 + 6$$

$$-2 = 4a$$

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

$$f(-3) = 4$$

point : $(-3, 4)$

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

OR

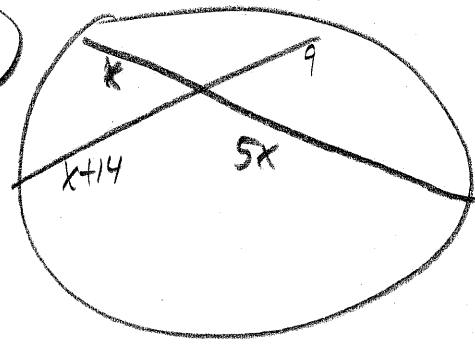
$$f(x) = -\frac{1}{2}(x^2 + 2x + 1) + 6$$

$$= -\frac{1}{2}x^2 - x - \frac{1}{2} + \frac{12}{2}$$

$$f(x) = -\frac{1}{2}x^2 - x + \frac{11}{2}$$

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#34)



$$x(5x) = 9(x+4)$$

$$5x^2 = 9x + 126$$

$$5x^2 - 9x - 126 = 0$$

$$(5x + 21)(x - 6) = 0$$

~~$x = -\frac{21}{5}$~~
~~reject~~

$x = 6$
 keep

[p. 29]

#26)

$$\frac{i^2 + 2i^3}{i}$$

$$\frac{i^2}{i} + \frac{2i^3}{i}$$

$$i + 2i^2$$

$$i + 2(-1)$$

$-2 + i$

#34)

$$(3x - 4y) + (6x + 2y)i = 5i$$

$$3x - 4y = 0$$

$$6x + 2y = 5$$

$$3x - 4y = 0$$

$$12x + 4y = 10$$

$$15x = 10$$

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

$$6\left(\frac{2}{3}\right) + 2y = 5$$

$$4 + 2y = 5$$

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

$x = \frac{2}{3}, y = \frac{1}{2}$