

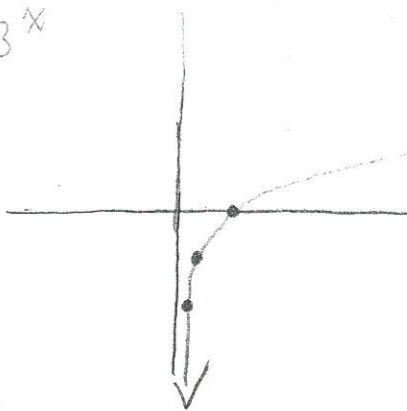
Friday 1/30 5.2.1 (5-60 → 5-67)

5-60) $y = 3^x$

x	y
-2	$\frac{1}{9}$
-1	$\frac{1}{3}$
0	1
1	3
2	9

Inverse

x	y
$\frac{1}{9}$	-2
$\frac{1}{3}$	-1
1	0
9	2



D: $x > 0$
 R: all real #s
 x-intercept (1, 0)
 No y-intercept

Asymptote $x = 0$

5-61) $f(x) = \frac{2}{7-x}$ a) undefined ~~$\frac{2}{7}$~~

b) $x \neq 7$

c) $g(3) = 2(3) + 5 = 6 + 5 = 11$

d) $f(g(3)) = \frac{2}{7-11} = \frac{2}{-4} = -\frac{1}{2}$

5-62) $f(x) = 1 + \sqrt{x+5}$ a) $e(x) = (x-1)^2 - 5$

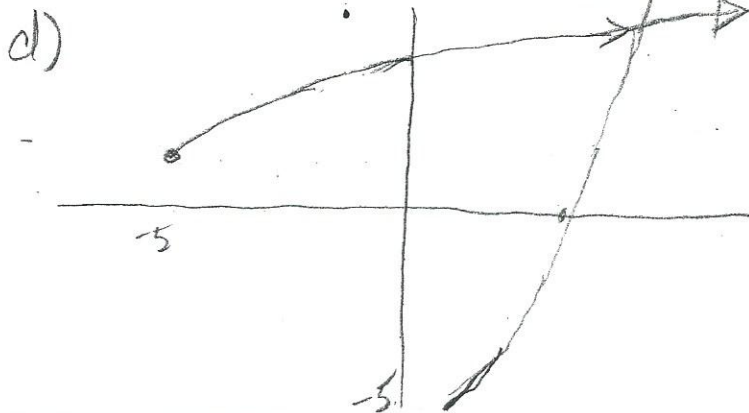
b) $f(-4) = 1 + \sqrt{-4+5} = 1 + 1 = 2$

$g(2) = (2-1)^2 - 5 = 1 - 5 = -4$

One machine undoes the other so

$e(f(-4)) = -4$

c) They would be reflections of each other across the line $y = x$

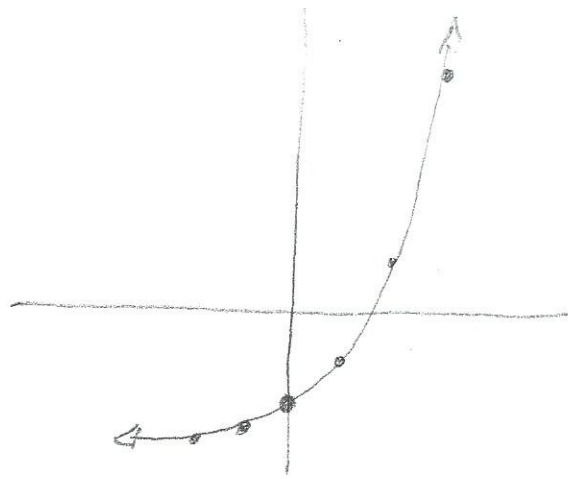


5.2.1 Cont'd

$$5-63) \quad y+3=2^x$$

$$y=2^x-3$$

x	y
-2	-11/4
-1	-2 1/2
0	-2
1	-1
2	1
3	5



a) D: All real #'s
R: $y > -3$

b) No line of symmetry

c) y-int (0, -2)
x-int. $2^x = 3$ (1.6, 0)

d) Sample: $y = 2^x + 3$

5-64) a) ~~$\frac{x}{41} = \frac{18}{23}$~~

$$23x = 18(41) \quad x = 36.78$$

$$\frac{23x}{23} = \frac{846}{23}$$

b) ~~$\frac{20}{35} = \frac{x}{55}$~~

$$\frac{35x}{35} = \frac{1100}{35} \quad x = 31.43$$

5-65) a) Bonds $B = .07(.3x)$ or $.021x$

b) Stock $S = .09(.7x)$ or $.063x$

c) $5000 = .021x + .063x$
 $\frac{5000}{.084} = \frac{.084x}{.084} \quad x = \$59,523.81$

$$5-66) a) x^2 - 49 \\ (x-7)(x+7)$$

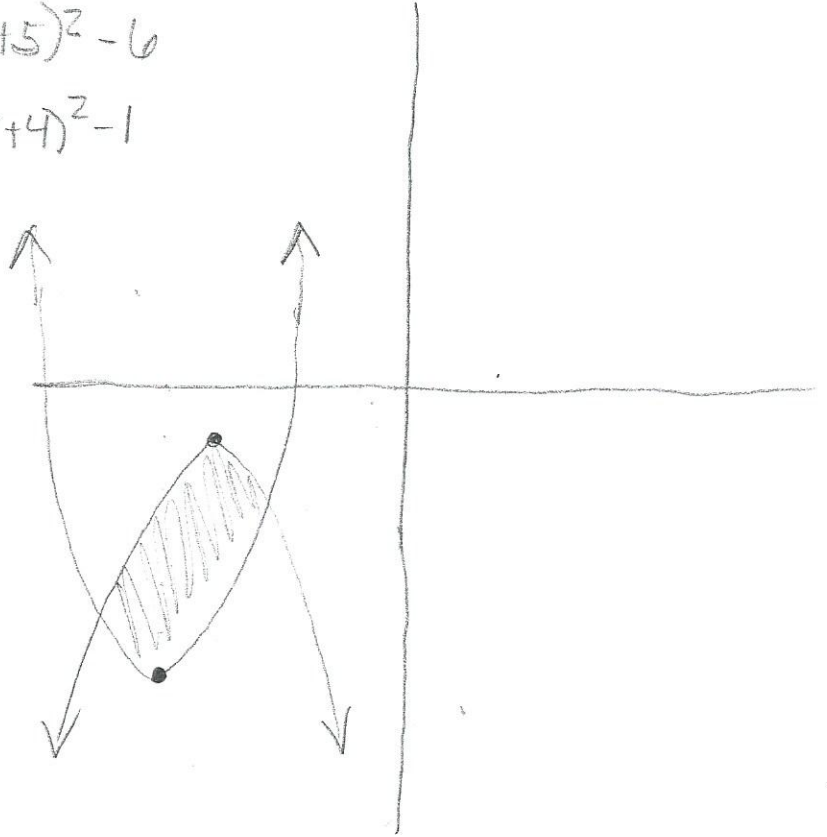
$$b) 6x^2 + 48x \\ 6x(x+8)$$

$$c) x^2 - x - 72 \\ (x-9)(x+8)$$

$$d) 2x^3 - 8x \\ 2x(x^2 - 4) \\ 2x(x+2)(x-2)$$

$$5-67) y \geq (x+5)^2 - 6$$

$$y \leq -(x+4)^2 - 1$$



Monday 2/2 5.2.2 (5-73 → 5-80)

5-73) $y = \log_2(x) \Rightarrow 2^y = x$

- they do not look the same
- they do mean the same thing
- they have the same graph or x, y table, one is just a rewritten equation of the other

5-74) a. $y = 5^x$ (Exp Form) $\log_5 y = x$ (Log Form)

b. $7^y = x$ $y = \log_7(x)$

c. $8^x = y$ $\log_8(y) = x$

d. $A^k = c$ $\log_A(c) = k$

e. $A^k = c$ $k = \log_A(c)$

f. $\left(\frac{1}{2}\right)^N = K$ $\log_{1/2}(K) = N$

5-75) a) $\frac{.95}{1/2} = \$1.9/1b$ b) Decrease

$1.38/1 = \$1.38/1b$

$1.92/2 = \$,96/1b$

$4.7/5 = \$,94/1b$

$9.04/10 = \$,90/1b$

$17.52/20 = \$,88/1b$

c) For smaller sizes

5-76) a) $x^2 + 7x - 8 = 0$
 $(x+8)(x-1) = 0$
 $x = -8 \quad x = 1$

Factor & use
Zero Product Property
rewrite

b) $\sqrt{(x+2)^2} = \sqrt{49}$
 $x+2 = \pm 7$
 $x = 7-2 = 5$
 $x = -7-2 = -9$

Take the square root
undo

5-76) a) $5x^2 - x - 7 = 0$

$Ac = -35$
cannot factor

$$x = \frac{-(-1) \pm \sqrt{(-1)^2 - 4(5)(-7)}}{2(5)} = \frac{1 \pm \sqrt{1 + 140}}{10} = \frac{1 \pm \sqrt{141}}{10}$$

use Quadratic Formula

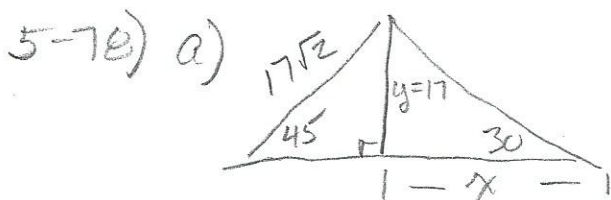
d) $x^2 + 4x = -1$
 $x^2 + 4x + 4 = -1 + 4$
 $(x+2)(x+2) = 3$
 $\sqrt{(x+2)^2} = \sqrt{3}$
 $x+2 = \pm 3$
 $x = -2 \pm 3$

Complete the Square
rewrite

5-77) $10^{3x} = 10^{(x-8)}$

$$3x = x - 8$$

$$\frac{2x}{2} = \frac{-8}{2} \quad \boxed{x = -4}$$

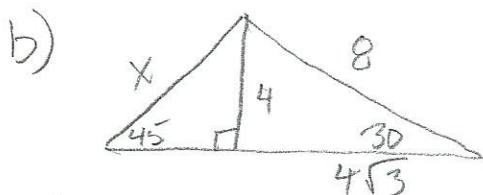


$$\frac{y\sqrt{2}}{\sqrt{2}} = \frac{17\sqrt{2}}{\sqrt{2}}$$

$$y = 17$$

use special rt Δ 's
 45-45-90
 30-60-90

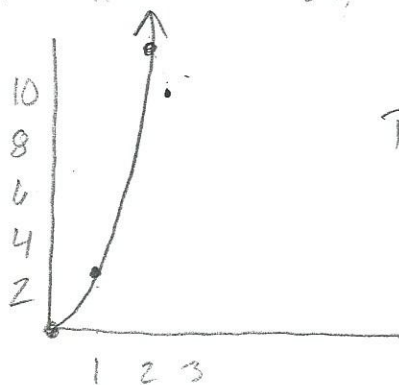
$$\boxed{x = 17\sqrt{3}}$$



$$\boxed{x = 4\sqrt{2}}$$

5-79) $A = 4\pi r^2$ so $f(r) = 4\pi r^2$

r	$f(r)$
0	0
1	4π
2	16π
3	36π
4	64π



D: $r \geq 0$
 R: $f(r) \geq 0$

No asymptotes

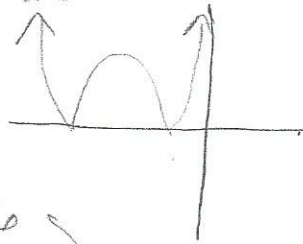
Half a parabola

5-80) $y = (x+6)^2 - 7$

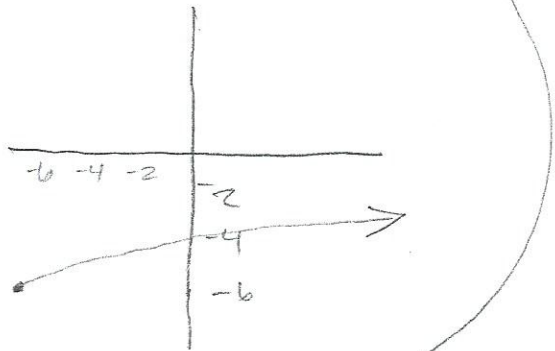
a) the parabola opens up with a vertex of $(-6, -7)$

b) To change you would need to shift up 9 units

c) The graph is the same except the region below the x-axis is reflected across the axis so that the graph is entirely above the x-axis



d) $y^{-1} = \sqrt{x+7} - 6$



e)

$y = \sqrt{x+7} - 6$