

Ch. 2 Review - Part I

Name _____ Per. _____

Key

① Write a transformation equation, $T(x)$, for each situation

a) $y = \sqrt{x}$ after it has been translated 2 left, 5 down, and compressed vertically by 0.2

$y = 0.2\sqrt{x+2} - 5$

b) $y = 5^x$ after it has been translated 16 right, 3 down, and stretched vertically by 4.

$y = 4(5^{x-16}) - 3$

c) $y = \frac{1}{x}$ after it has been translated down 100 and 200 up right

$y = \frac{1}{x-200} - 100$

② What is the domain of $y = \frac{1}{x-4}$?

range $-\infty < x < \infty$
 $x \neq 4$
 $-\infty < y < \infty$
 $y \neq 0$

③ Factor the quadratic expression (not solve anything. Just factor).

$$\begin{array}{cc|cc} & 2x & 3 & & \\ 5x & 10x^2 & 15x & & \\ \hline -2 & -4x & -6 & & \end{array}$$
~~$$\begin{array}{c} -60x^2 \\ \hline 11x \end{array}$$~~

$10x^2 + 11x - 6$

Possibilities

x	-60x	4x	-15x
-x	60x	-4x	15x
2x	-30x		
-2x	30x		
3x	-20x		
-3x	20x		

$= (5x-2)(2x+3)$

④ Triangulum (M33) wants to find the exponential function that passes through the points (2, 75.6) and (6, 97977.6). Assuming that the graph has an asymptote at $y=0$, what is the equation of the function? Show all of your work!

$$75.6 = ab^2$$

$$97977.6 = ab^6$$

 solve for a

$$a = \frac{75.6}{b^2}$$

$y = ab^x$

$97977.6 = \left(\frac{75.6}{b^2}\right)b^6$

$75.6b^4 = 97977.6$

$b^4 = \frac{97977.6}{75.6}$

$b = 6$

$a = \frac{75.6}{6^2} = 21$

$$y = 21(6)^x$$

5) Convert to graphing form $[y = x^2 + 2x - 15]$

(Practice both methods ... Completing the square and Averaging the x-intercepts)

$$y = x^2 + 2x - 15$$

$$y + 1 = x^2 + 2x + 1 - 15$$

$$y + 1 = (x + 1)^2 - 15$$

$$y = (x + 1)^2 - 16$$

$$\left(\frac{b}{2}\right)^2$$

$$\left(\frac{2}{2}\right)^2 = 1$$

If using Averaging the x-intercepts you must

a) show function = 0
Solve equation

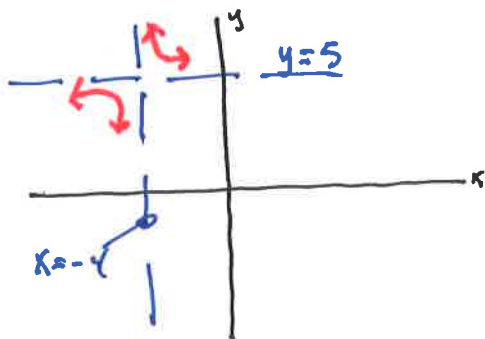
b) show averaging of x-intercepts

c) show Vertex

d) Write function in graphing form

Also, find the y-intercept.

6) Sketch $y = \frac{1}{x+4} + 5$. Then specify any asymptotes and their equations. Use "HA" for horizontal and VA for vertical



$$\text{HA: } y = 5$$

$$\text{VA: } x = -4$$

7) Solve the system of linear equations

$$4x - y = -13$$

$$3x + 2y = 4$$

$$2x - 2y = -26$$

$$3x + 2y = 4$$

Add two equations

$$11x = -22$$

$$x = -2$$

$$4(-2) - y = -13$$

$$\begin{array}{r} -8 - y = -13 \\ +8 \quad +8 \end{array}$$

$$-y = -5$$

$$y = 5$$

solution

$$x = -2$$

$$y = 5$$

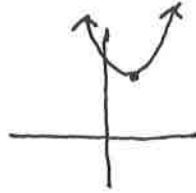
detailed Algebra steps required regardless of your method

Review
Assignment - Part II

SOLUTIONS

2 147, 170-171, 174-175^a, 177-179, 181

2-147 sketch $y = 2(x-1)^2 + 4$ →



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

- b) There is no difference in their graphs
 c) Parent is $y = x^2$
 d) Parent is $y = x^2$

2-170 a) Vertex ^{Parabola} $(-4, 3)$ →

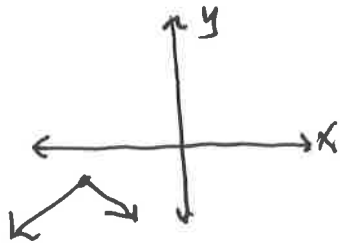
$y = (x+4)^2 + 3$ The middle of the parabola is at $x = -4$ so the vertical line of symmetry is $x = -4$

b) $y = -(x+4)^2 + 3$... it still has the same center so it also has the same line of symmetry

c) $y = -(x+4)^2 + 3$ ^{Add -8} ~~replace~~ → $y = -(x-3)^2 - 5$
 replace x with $x-7$

2-171

a) $f(x) = -|x+2| - 1$



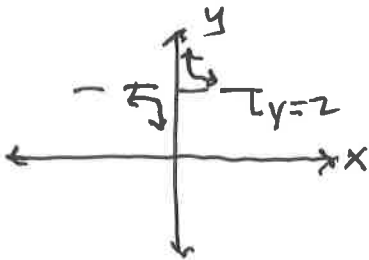
locator point

$(-2, -1)$

Asymptotes

none

b) $y = \frac{1}{x} + 2$

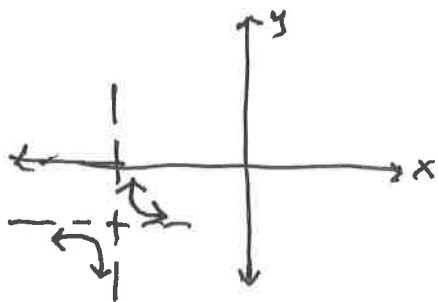


$(0, 2)$

HA: $y = 2$

VA: $x = 0$

c) $y = \frac{1}{x+5} - 2$

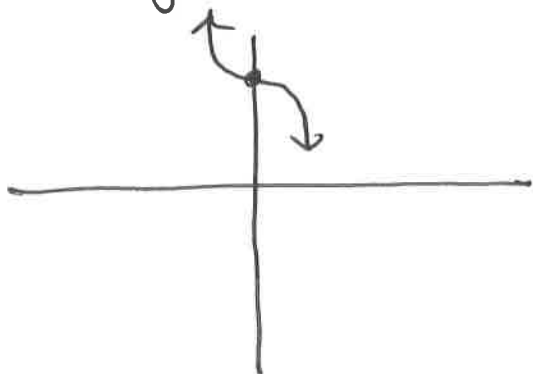


$(-5, -2)$

HA: $y = -2$

VA: $x = -5$

d) $y = -x^3 + 5$



$(0, 5)$

NONE

2-174

a. $y = 0.25(x+3)^2 - 12$

b) $y = 2(x+6)^3 + 1$

c) $y = \frac{1}{(x-2)} - 6$

2-175

$y = ab^x$
exponential

a) (2, 99) (6, 8019)

$99 = ab^2$

$8019 = ab^6$

$a = \frac{99}{b^2}$

$8019 = \frac{99}{b^2} \cdot b^6$

$8019 = 99b^4$

$b^4 = \frac{8019}{99}$

$\sqrt[4]{\quad} \quad \sqrt[4]{\quad}$

$b = 3$

$a = \frac{99}{3^2}$

$a = 11$

$y = 11(3)^x$

b) (-1, 50) (2, 25.6)

$50 = ab^{-1}$

$25.6 = ab^2$

$a = \frac{50}{b^{-1}}$

$\frac{50}{b^{-1}} \cdot b^2 = 25.6$

$50 \cdot b^1 \cdot b^2 = 25.6$

$50b^3 = 25.6$

$b^3 = \frac{25.6}{50}$

$\sqrt[3]{\quad} \quad \sqrt[3]{\quad}$

$b = 0.8$

$a = \frac{50}{.8^{-1}} = 40$

$y = 40(.8)^x$

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

↓

Vertex $(1, -9)$

$$4 + 2 = \frac{2}{2} = 1$$

↓

$$x = 4 \quad x = -2$$

$$x - 4 = 0 \quad x + 2 = 0$$

↑ zpp ↓

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

X-intercepts

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

$$= -8$$

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

Y-intercept

↑

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

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

f(-4)

$$(-4, -4)$$

Vertex

$$(-2, 0) \quad (0, 0)$$

$$x = -2 \quad x = 0$$

$$x^2 + 8x + 12 = 0$$

$$(x+2)(x+6) = 0$$

X-intercepts

X-int

$$(0, 12)$$

Y-int

$$y = 12$$

$$y = (0)^2 + 8(0) + 12$$

$$(0,)$$

Y-int

$$y = x^2 + 8x + 12$$

$$2 - 177$$

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

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

$$\frac{z}{z-x} = -y$$

$$z = -y(z-x)$$

$$z - xz = -yz$$

$$z(1-x) = -yz \quad (b)$$

$$y = x - 2.5$$

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

$$-2y = \frac{z}{x} - \frac{2z}{5}$$

$$-2x - 2y = \frac{z}{5}$$

$$-2x - 2y = \frac{z}{5} \quad (a)$$

$$\boxed{2-181}$$

$$= \$4.55$$

$$b) y = 8.95(1.07)^{-10}$$

$$(100\% + 7\% = 107\% \rightarrow 1.07)$$

beginning \$8.95 + 7% per year

$$\boxed{2-179}$$

$$= \$17.67$$

$$a) y = 8.95(1.07)^{10}$$

ANSWER

$$\rightarrow 2(2x+5)(2x+1)$$

$$2(4x^2 + 12x + 5)$$

$$8x^2 + 24x + 10$$

factor out a 2

b)

$2x^2$	5
$4x$	$10x$
$2x$	5

ANSWER

$$\rightarrow (2x-1)(x+4)$$

$$2x^2 + 7x - 4$$

a)

$$\boxed{2-178}$$

$2x^2$	4
$7x$	-4
x	-1

$$-2x^2 - 7x + 4$$