

Pick up the Warm Up
and the Ch. 2 Test
info sheet

HW Questions

The Chapter 2 test is Thursday

It's Friday
Warm Up

1a. Find both the x- and y- intercepts of $y = +x^2 + 2x - x(2x-4)$

y-intercept
set $x=0$

x-intercept
set $y=0$

Advice
Simplify
ASAP

#5 Friday Warm Up

1a. Find both the x- and y- intercepts of $y = +x^2 + 2x - x(2x-4)$

y-intercept
set $x=0$

x-intercept
set $y=0$

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

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

$-x^2 + 2x = 0$
factor out
 x

so
 $(0, 0)$
 $x \quad y$

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

so x-intercepts are $(0, 0)$ and $(2, 0)$

b. then find the vertex by averaging the x-intercepts

$\frac{0+2}{2} = 1$ $(1, \quad)$

$f(1) = -(1)^2 + 2(1)$
 $= -1 + 2$
 $= 1$

c. then write the equation in graphing form
 $y = x^2$ $y = -x^2$ $y = -(x-1)^2 + 1$

d. what is locator point?

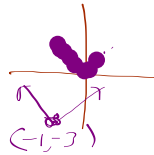
its the vertex
 $(1, 1)$

$y = -x^2 + 2x$

② For $y = |x+1| - 3$ find the intercepts
 the locator point $(-1, -3)$
 the domain $-\infty < x < \infty$
 the range $-3 \leq y < \infty$

y-int

$(0, -2)$ ✓



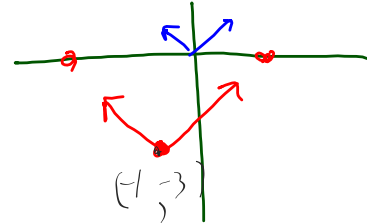
x-int
 set $y=0$

$$|x+1| - 3 = 0$$

$$|x+1| = 3$$

$$\begin{array}{l} x+1 = 3 \\ -1 \quad -1 \end{array} \quad \begin{array}{l} x+1 = -3 \\ -1 \quad -1 \end{array}$$

$$\begin{array}{l} x = 2 \\ (2, 0) \end{array} \quad \begin{array}{l} x = -4 \\ (-4, 0) \end{array} \quad \checkmark$$



$$\begin{array}{l} |x+1| - 3 = 0 \\ +3 \quad +3 \end{array}$$

$$|x+1| = 3$$

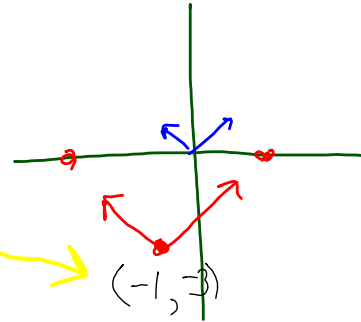
$$\begin{array}{l} x+1 = 3 \\ -1 \quad -1 \end{array}$$

$$x = 2$$

$$\begin{array}{l} x+1 = -3 \\ -1 \quad -1 \end{array}$$

$$x = -4$$

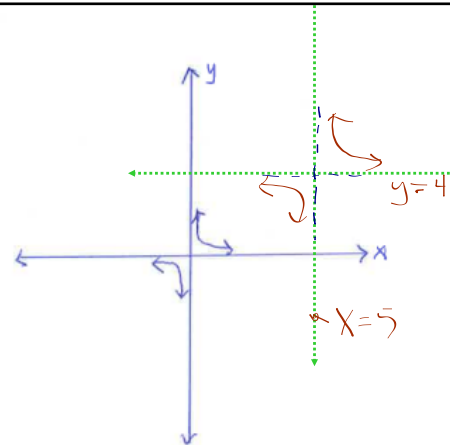
the intercepts
 the locator points
 the domain
 the range



③ sketch $f(x) = \frac{1}{x-5} + 4$ with its asymptotes, write the equation of each asymptote,
 (Hint: What is the parent of $f(x)$?)

HA: $y = 4$

VA: $x = 5$



④ suppose $g(x) = x^2 + 2x$
Create a function $f(x)$ that is created by translating
 $g(x)$ five units to the right.

$$f(x) = (\quad)^2 + 2(\quad)$$

x x

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

See your
LCO



- ① Use the *method of Completing the Square* to convert $y = x^2 - 10x + 27$ to graphing form. The steps, with appropriate notation, must be shown to get full marks.

$$y = \begin{array}{|c|c|} \hline x^2 & -5x \\ \hline -5x & \\ \hline \end{array} + 27$$

✓✓✓✓ Process shown with appropriate details and good notation

$$y + 25 = x \begin{array}{|c|c|} \hline x & -5 \\ \hline -5 & 25 \\ \hline \end{array} + 27$$

✓✓ Answer

$$y + 25 = (x-5)^2 + 27 - 25$$

$$y = (x-5)^2 + 2$$

Final Equation

1. Use the *method of Completing the Square* to convert $y = x^2 - 10x + 27$ to graphing form. The steps must be shown to get full marks

$$y + 25 = x \begin{array}{|c|c|} \hline x & -5 \\ \hline -5 & 25 \\ \hline \end{array} + 27$$

$$\rightarrow y + 25 = (x-5)^2 + 27 \rightarrow \boxed{y = (x-5)^2 + 2}$$

2. Use the *method of averaging the x-intercepts* to help convert $y = x^2 - 12x + 27$ to graphing form. The steps, with appropriate details and notation, must be shown to get full marks.

1
Must show $y=0$
If factoring

$$\Rightarrow x^2 - 12x + 27 = 0$$

$$(x-3)(x-9) = 0$$

ZPP

$x=3$ $x=9$
are the x-intercepts

✓✓✓ process
✓✓ Final Answer

2
Must show Averaging

$$\Rightarrow \frac{3+9}{2} = 6$$

3
find vertex

$$\Rightarrow (6, -9)$$

\uparrow
 $(6)^2 - 12(6) + 27$

$$y = (x-6)^2 - 9$$

Final Equation

v.1

2. Use the *method of using x-intercepts* to help convert $y = x^2 - 12x + 27$ to graphing form. The steps must be clearly shown to get full marks. Good notation expected.

-a	-4x	27
x	x^2	-3x
	x	-3

$$\begin{array}{r} -a \times \quad 27x^2 \\ \quad \quad \quad -3x \\ \hline \quad \quad \quad -12x \end{array}$$

$$(x-3)(x-9) = 0 \text{ :)$$

$x=3$ $x=9$
:)

$$\frac{3+9}{2} = 6$$

:)

$$y = (6)^2 - 12(6) + 27$$

$$y = 36 - 72 + 27$$

$$y = -9$$

$$(6)^2 - 9$$

$$\rightarrow y = (x-6)^2 - 9$$

Final Equation

2. Use the *method of using x-intercepts* to help convert $y = x^2 - 12x + 20$ to graphing form. The steps must be clearly shown to get full marks. Good notation expected.

$$x^2 - 12x + 20 = 0 \quad \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \rightarrow \frac{12 \pm \sqrt{144 - 4 \cdot 1 \cdot 20}}{2}$$

$$\rightarrow \frac{12 \pm \sqrt{64}}{2} \left\{ \begin{array}{l} x=10 \\ x=2 \end{array} \right. \text{average } (10+2)/2 = 6 \rightarrow \text{vertex } (6, -16)$$

$$y = 6^2 - 12 \cdot 6 + 20 \rightarrow y = -16 \quad 6^2 + 20 \rightarrow y = 16$$

$$y = (x-6)^2 - 16$$

Final Equation

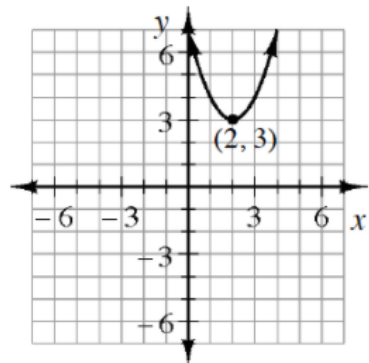
v.2

Questions on HW ?

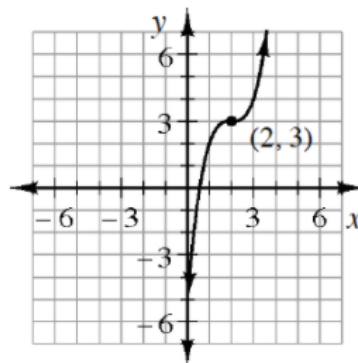
110a

107

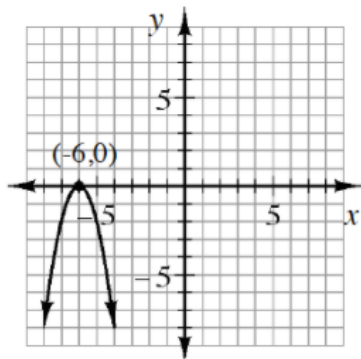
a.



b.



c.



107 c

2-111.

a. $5^{-2} \cdot 4^{1/2}$

b. $\frac{3xy^2z^{-2}}{(xy)^{-1}z^2}$

c. $(3m^2)^3(2mn)^{-1}(8n^3)^{2/3}$

d. $(5x^2y^3z)^{1/3}$

113@ $y = 2(x-17)^2$ Solve for x

(b)

Solve for x

$$y + 7 = \sqrt[3]{x+5}$$

Test Information

Analyze Transformations of Functions

$$f(x) = \sqrt{x} \quad \text{for parent}$$

$$T(x) = ? \quad \text{for transformation}$$

① Parent Graph Name: Absolute Value

a) Parent Equation: $y = |x|$

b) Description of Transformation:
negative orientation with a vertical stretch of 3, translated 2 units to the right

c) Sketch Transformed Graph, $T(x)$
(Parent is already shown)

d) Write coordinates of the new locator point. $(2, 0)$

e) Write Transformation function, $T(x)$

$$T(x) = -3|x-2|$$

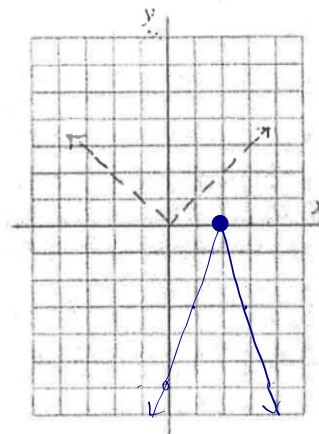
f) List domain of $T(x)$ $-\infty < x < \infty$ List range of $T(x)$ $-\infty < y \leq 0$

g) List equation(s) of any asymptotes of $T(x)$

none

h) Describe any symmetry

reflective symmetry about $x=2$



② Parent Graph Name: Exponential Growth

a) Parent Equation: $y = 2^x$

b) Description of Transformation:
Translate down 6 units

c) Sketch Transformed Graph, $T(x)$
(Parent is already shown)

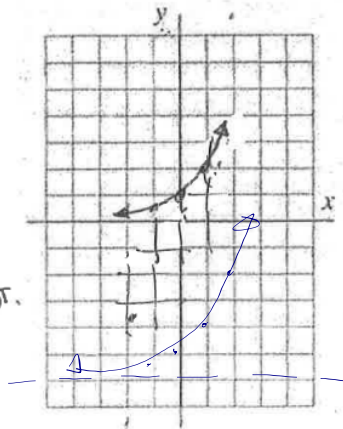
d) Write coordinates of the new locator point. *use y-intercept.*
 $(0, -5)$

e) Write Transformation function, $T(x)$
 $T(x) = 2^x - 6$

f) List domain of $T(x)$ $-\infty < x < \infty$ List range of $T(x)$ $-6 < y < \infty$

g) List equation(s) of any asymptotes of $T(x)$
H.A. $y = -6$

h) Describe any symmetry
none



③ Parent Graph Name: Cubic

a) Parent Equation: x^3

b) Description of Transformation:

3 to the left

1 up

c) Sketch Transformed Graph, $T(x)$
(Parent is already shown)

d) Write coordinates of the new locator point.

$(-3, 1)$

e) Write Transformation function, $T(x)$

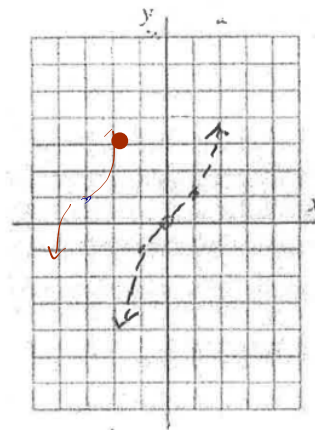
$T(x) = (x+3)^3 + 1$

f) List domain of $T(x)$ $-\infty < x < \infty$ List range of $T(x)$ $-\infty < y < \infty$

g) List equation(s) of any asymptotes of $T(x)$
none

h) Describe any symmetry

$x = -3$
 180° rotational symmetry
about $(-3, 1)$



④ Parent Graph Name: Parabola

h) Parent Equation:

i) Description of Transformation:

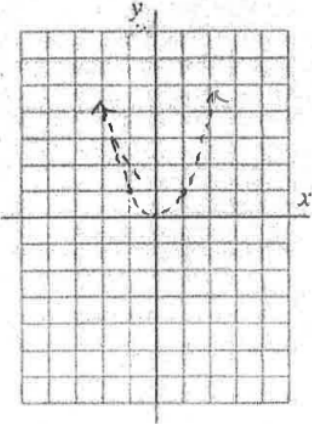
j) Sketch Transformed Graph, $T(x)$
(Parent is already shown)

k) Write coordinates of the new locator point.

l) Write Transformation function, $T(x)$

m) List domain of $T(x)$ _____ List range of $T(x)$ _____

n) List equation(s) of any asymptotes of $T(x)$ h) Describe any symmetry



⑤ Parent Graph Name: Hyperbola (reciprocal)

o) Parent Equation: $y = \frac{1}{x}$

p) Description of Transformation:
Translate 3 units right and 5 units up

q) Sketch Transformed Graph, $T(x)$

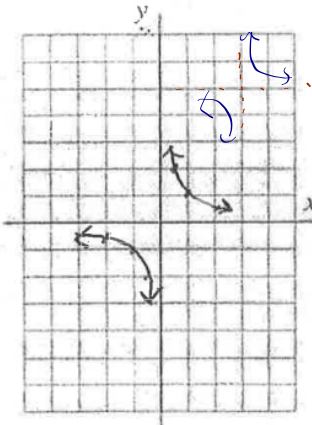
r) Write coordinates of the new locator point.

s) Write Transformation function, $T(x)$
 $T(x) = \frac{1}{x-3} + 5$

t) List domain of $T(x)$ $-\infty < x < \infty$ except $x=3$ List range of $T(x)$ $-\infty < y < \infty$ except $y=5$

u) List equation(s) of any asymptotes of $T(x)$
HA: $y=5$
VA: $x=3$

h) Describe any symmetry
rotational symmetry
 180° around $(3, 5)$



⑥ Parent Graph Name:

v) Parent Equation: $y = \frac{-1}{x^2}$

w) Description of Transformation:

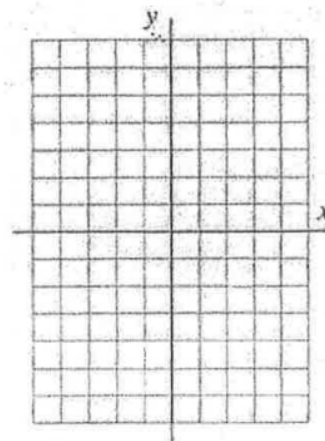
x) Sketch Transformed Graph, $T(x)$
(Parent is already shown)

y) Write coordinates of the new locator point.

z) Write Transformation function, $T(x)$

aa) List domain of $T(x)$ _____ List range of $T(x)$ _____

bb) List equation(s) of any asymptotes of $T(x)$ h) Describe any symmetry



Work Backwards
starting from graph

Name _____ per. _____

⑦ Parent Graph Name:

a) Parent Equation:

b) Description of Transformation:

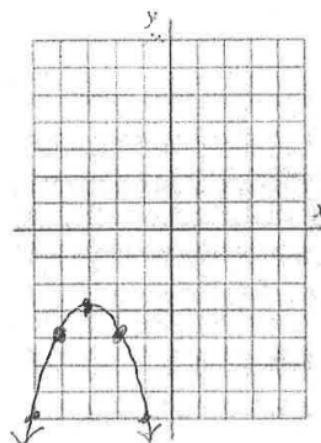
c) Sketch Transformed Graph, $T(x)$
(Parent is already shown)

d) Write coordinates of the new locator point.

e) Write Transformation function, $T(x)$

f) List domain of $T(x)$ _____ List range of $T(x)$ _____

g) List equation(s) of any asymptotes of $T(x)$ h) Describe any symmetry



Assignment

Finish the Analyzing Functions Packet