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

y-intercept
set x=0

X-intercept
set y=0

Advice
Simplify
ASAP

it's Friday

Warm Up

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

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

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

y-intercept

set $x = 0$

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

$$= 0$$

so

$(0, 0)$

x-intercept

set $y = 0$

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

common?

$x(-x+2) = 0$

ZPP

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

$\quad\quad\quad 2 = x$

$x = 0$ $x = 2$

b

$$\frac{0+2}{2} = 1$$

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

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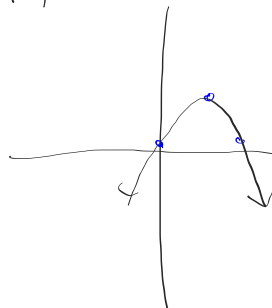
$$f(1) = -(1)^2 + 2(1)$$

c. Then write the equation in graphing form

$$y = x^2$$

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

d. What is locator point?

Same as vertex $(1, 1)$

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

② For $y = |x+1| - 3$ find the intercepts
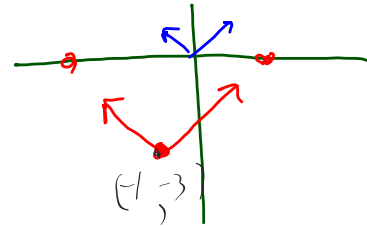the locator point
the domain –
the range

y-int $(0, -2)$

$y = |0+1| - 3$
$= 1 - 3$
$= -2$

x-int
set $y = 0$

$(-1, 3)$

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

$|x+1| = 3$

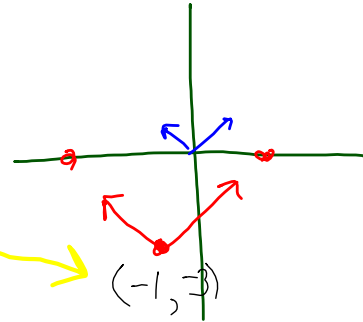$x + 1 = 3$ $x + 1 = -3$
$-1 \quad -1$ $-1 \quad -1$

$x = 2$ $x = -4$

the intercepts
the locator point
the domain
the range
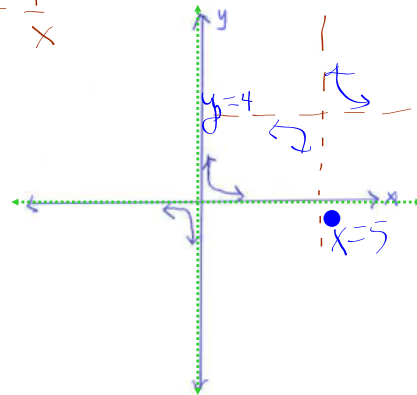
$$y = |x+1| - 3$$

$(-1, -3)$

$$-3 \leq y < \infty$$

③ sketch $f(x) = \dfrac{1}{x-5} + 4$ with its $y = \dfrac{1}{x}$

asymptotes. write the equation
of each asymptote.
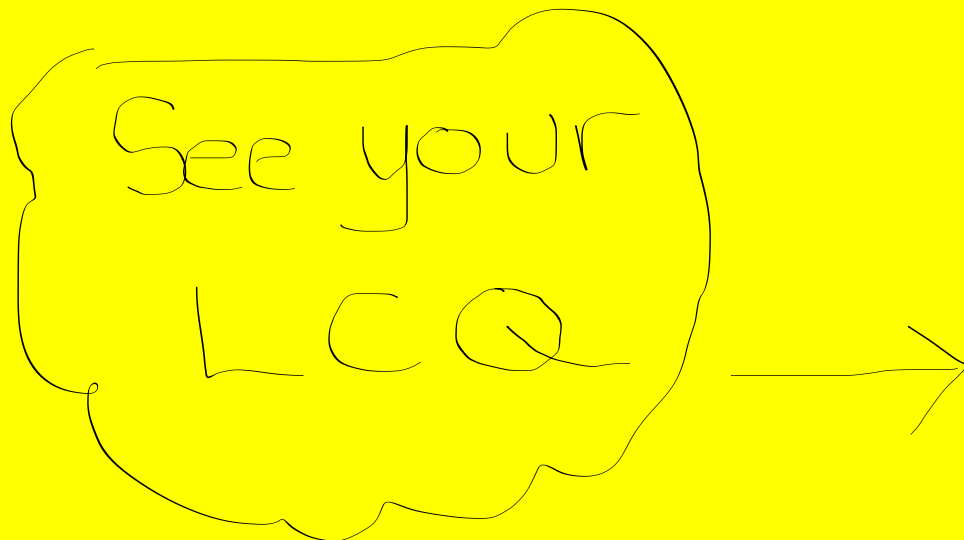
(HINT: what is the parent
of $f(x)$?)

$y = 4$

$x = 5$

↪ 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.

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

x x

$f(x)$

See your
LCQ →

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.

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

$$y + 25 = x\boxed{\begin{array}{|c|c|} \hline x^2 & -5x \\ \hline -5x & 25 \\ \hline \end{array}} + 27$$
$$\quad\quad\quad\quad -5$$

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

✓✓✓ Process shown with appropriate details and good notation

✓ ANSWER

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

_____
Final Equation

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

$$\quad\quad\quad\quad\quad x \quad -5$$
$$y + 25 = \; x \boxed{\begin{array}{|c|c|} \hline x^2 & -5x \\ \hline -5 & +5x & 25 \\ \hline \end{array}} + 27$$

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

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

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

ZPP

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

② must show averaging $\Rightarrow \dfrac{3+9}{2} = 6$

③ find vertex $\Rightarrow (6, -9)$

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

✓✓✓ process
✓✓ Final Answer

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

v.1

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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.

-9	$-9x$	27
x	x^2	$-3x$
	x	-3

$-9x \diagup^{27x^2}_{-3x}$
$\diagdown_{-12x}$

$(x-3)(x-9) = 0$ ☺
$x=3 \quad x=9$ ☺

$\dfrac{3+9}{2} = 6$ ☺

$y = (6)^2 - 12(6) + 27$
$y = 36 - 72 + 27$
$y = -9$

$(6, -9)$

$\rightarrow y = (x-6)^2 - 9$ ☺
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.

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

$$\rightarrow \frac{12 \pm \sqrt{64}}{2} \begin{cases} \boxed{x = 10} \\ \boxed{x = 2} \end{cases} \text{average} \quad (10 + 2)/2 = 6 \qquad \text{vertex } (6, -16)$$

$$y = 6^2 - 12 \cdot 6 + 20 \rightarrow \boxed{y = -16}$$

$$\boxed{y = (x - 6)^2 - 16}$$

_____
Final Equation

v.2

Questions on HW ?

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110a

a.

(2, 3)

b.

(2, 3)

c.

(-6,0)
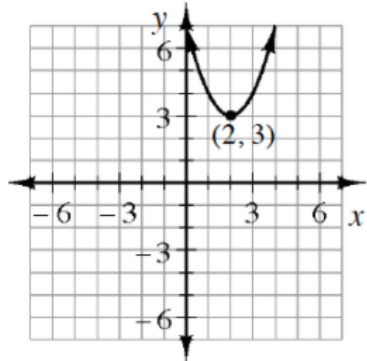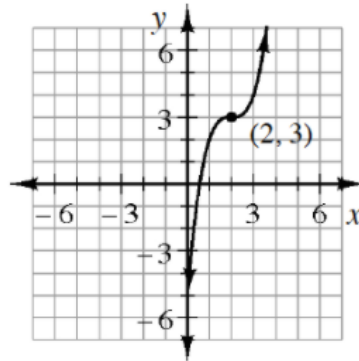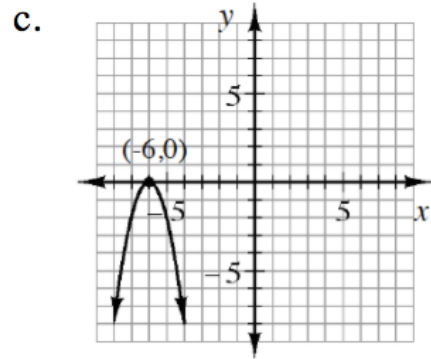
107 c

2-111.

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

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

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

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

113ⓐ $\quad y = 2(x-17)^2 \qquad$ Solve for x

(b) Solve for x

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

Test Information

Part 1   No GDC
          No reference sheet

Part 2   Yes - GDC
          Yes - reference sheet   } Notes CAP

I

Analyze Transformations of Functions

$$y = \sqrt{x}$$

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

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

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① **Parent Graph Name:** Absolute Value

a) **Parent Equation:** $y = -\dfrac{1}{x^2}$ $\qquad y = |x|$

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)

$(2, 0)$

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

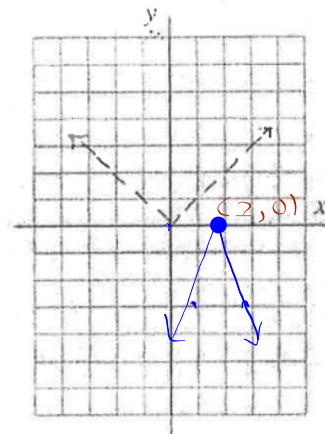e) **Write Transformation function, $T(x)$**

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

f) **List domain of $T(x)$** $\underline{-\infty < x < \infty}$ **List range of $T(x)$** $\underline{-\infty < y \le 0}$

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

h) **Describe any symmetry** across line $x = 2$

② **Parent Graph Name:** Exponential Growth

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

    b) Description of Transformation:

        Translate down 6 units

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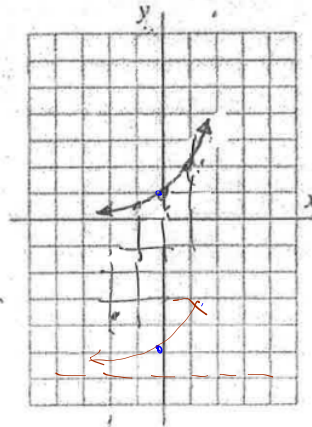   *(Parent is already shown)*

    d) Write coordinates of the new locator point. Use y-intercept.

    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

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③ **Parent Graph Name:** Cubic

    a) Parent Equation:

    b) Description of Transformation:

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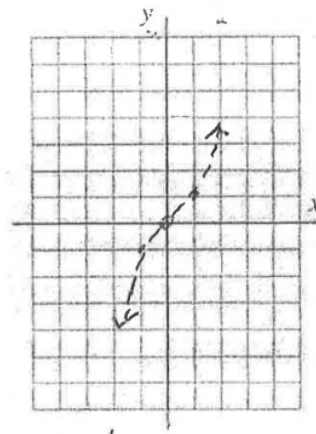   *(Parent is already shown)*

    d) Write coordinates of the new locator point.

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

     _____

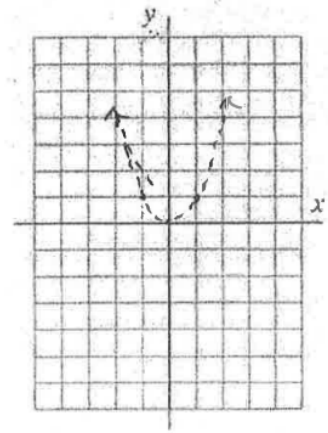   f) List domain of $T(x)$ _____ List range of $T(x)$ _____

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

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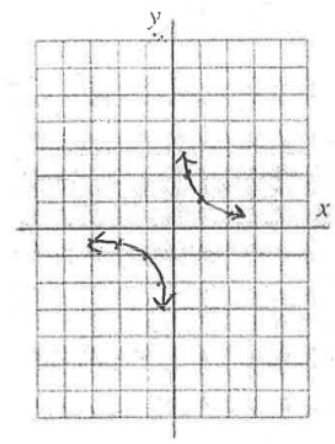
l) Write Transformation function, $T(x)$

_____

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

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⑤ **Parent Graph Name:** Hyperbola (reciprocal)

o) Parent Equation:

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

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

6) **Parent Graph Name:**

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

w) Description of Transformation:

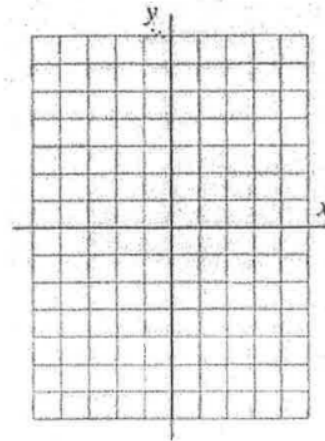x) Sketch Transformed Graph, $T(x)$
   (Parent is already shown)

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

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Work Backwards Starting from graph   Name _____
                                                          per.____

7) **Parent Graph Name:**

a) Parent Equation:

b) Description of Transformation:

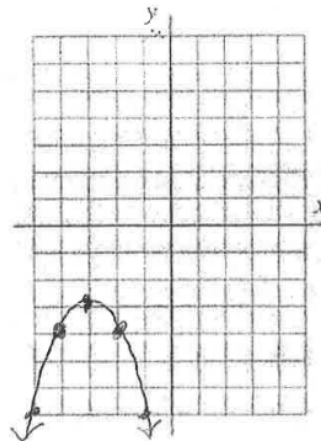c) Sketch Transformed Graph, $T(x)$
   (Parent is already shown)

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

Work backwards

8 **Parent Graph Name:**

h) Parent Equation:

i) Description of Transformation:

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

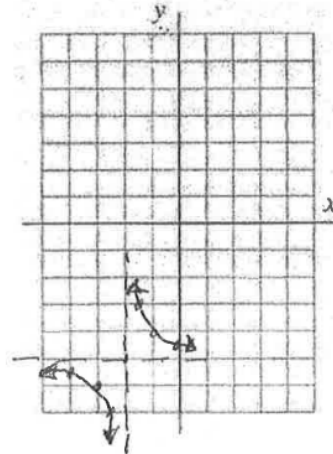k) Write coordinates of the new locator point.

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

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DIRECTIONS: Simplify the following expressions. The wor...
complete the statement correctly.

1. $(3x^2)(10x^4)$ **2.**
     Irena Sendler was born in ____, Poland in 1910.
        a. $13x^8$ Krakow
        b. $30x^8$ Lodz
        c. $30x^6$ Warsaw

<u>Assignment</u>

Finish the Analyzing Functions Packet