① Check your LCQ, then turn it in.

QUESTIONS ON HW

② then Pick Up the Warm Up

1. If $g(x) = x^2 - 5$, find

a) $g(\frac{1}{2}) = (\frac{1}{2})^2 - 5$

$= \frac{1}{2} \cdot \frac{1}{2} - 5 = \frac{1}{4} - 5$

$= -4.75$

b) $g(-5) =$

$(-5)^2 - 5$

$= 25 - 5 = 20$

c) $g(h+1) = x^2 - 5$

$= (h+1)^2 - 5$

$= (h+1)(h+1) - 5$

c) $g(h+1) =$

$(h+1)^2 - 5$

$(h+1)(h+1) - 5$

$h^2 + h + h + 1 - 5 = \boxed{h^2 + 2h - 4}$

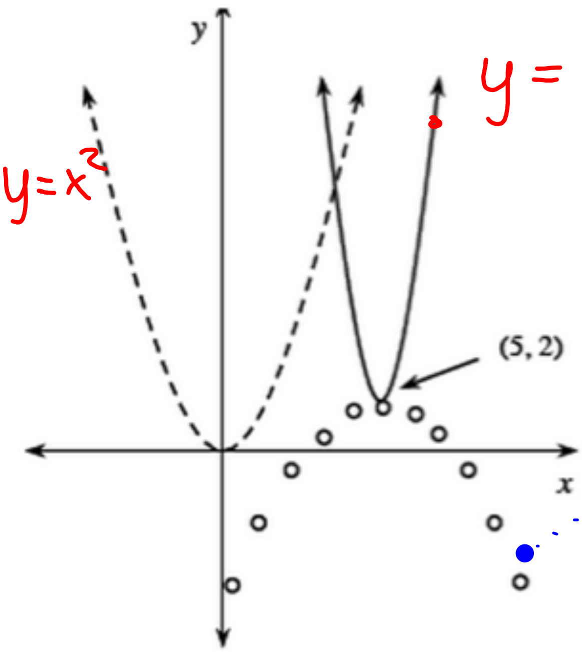
$(x+7)^2 \neq x^2 + 49$

$(x+7)(x+7)$

$x^2 + 7x + 7x + 49$

$= x^2 + 14x + 49$

2. The graph of $y = x^2$ is shown as a dashed curve at right. Estimate the equations of the two other parabolas.



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

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

3. Write each expression below in simplest radical form.

$\sqrt{75} + \sqrt{27}$ $\qquad \sqrt{x} + 2\sqrt{x}$ $\qquad (\sqrt{12})^2$ $\qquad (3\sqrt{12})^2$

$\sqrt{25} \cdot \sqrt{3} + \sqrt{9} \cdot \sqrt{3}$

$5\sqrt{3} + 3\sqrt{3}$

$8\sqrt{3}$

3. Write each expression below in simplest radical form.

$\sqrt{75}+\sqrt{27}$ $\quad\quad$ $\sqrt{x}+2\sqrt{x}$ $\quad\quad$ $(\sqrt{12})^2$ $\quad\quad$ $(3\sqrt{12})^2$

3. Write each expression below in simplest radical form.

$\sqrt{75}+\sqrt{27}$ $\quad\quad$ $\sqrt{x}+2\sqrt{x}$ $\quad\quad$ $(\sqrt{12})^2$ $\quad\quad$ $(3\sqrt{12})^2$

$\sqrt{25}\cdot\sqrt{3}+\sqrt{9}\cdot\sqrt{3}$

$5\sqrt{3}+3\sqrt{3}$

$8\sqrt{3}$

$3\sqrt{x}$

12

$3^2\cdot\sqrt{12}^2$

$9\cdot 12$

108

3. Write each expression below in simplest radical form.

$\sqrt{75}+\sqrt{27}$

$\sqrt{25}\cdot\sqrt{3}+\sqrt{9}\cdot\sqrt{3}$

$5\sqrt{3}+3\sqrt{3}$

$8\sqrt{3}$

$\sqrt{x}+2\sqrt{x}$

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

$(\sqrt{12})^2$

12

$(3\sqrt{12})^2$

$3^2\cdot\sqrt{12}^2$

$9\cdot 12$

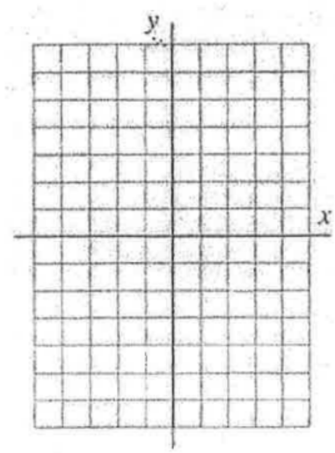
108

(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

Yesterday's HW

Compare your HW to mine

Today:

Notes

"A missing Transformation"

HW Lottery

Just Observe
for a moment

What kind of geometric transformation have you made when you replace

$f(x)$ with $f(x) + K$?

$y = x^2$ $y = x^2 + 3$

$y = \sqrt{x}$ $y = \sqrt{x} - 30$

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

$y = \frac{1}{x} + 7$

What kind of Geometric Transformations occur when you replace

$f(x)$ with $-f(x)$?

$y = x^3$ $y = -x^3$

$y = |x|$ $y = -|x|$

$y = -\sqrt{x}$

$y = \sqrt{x}$

What kind of geometric transformations happen if you replace

$f(x)$ with $f(x-h)$?

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

$y = ab^x$ $y = ab^{x+4}$

$y = \frac{1}{x}$ $y = \frac{1}{x+3}$

What kind if:

$f(x)$ to $a \cdot f(x)$

$f(x) = x^2$ $f(x) = 6x^2$

$f(x) = \sqrt{x}$ $f(x) = 5\sqrt{x}$

$f(x) = \frac{1}{x}$ $f(x) = 10 \cdot \frac{1}{x}$

New

What type of transformation takes place when you...

replace $f(x)$ with $f(-x)$

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

$y = \frac{1}{(x)}$ with $y = \frac{1}{(-x)}$

GDC

$y_2 = x^3$ with $y_1 = (-x)^3$

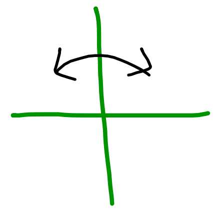
$y_2 = \frac{1}{x}$ with $y_1 = \frac{1}{(-x)}$

Summary NOTES

Replacing x with $(-x)$ creates a reflection across the y-axis

examples $y = x^3 \Rightarrow y = (-x)^3$

$y = \frac{1}{x} \Rightarrow y = \frac{1}{(-x)}$



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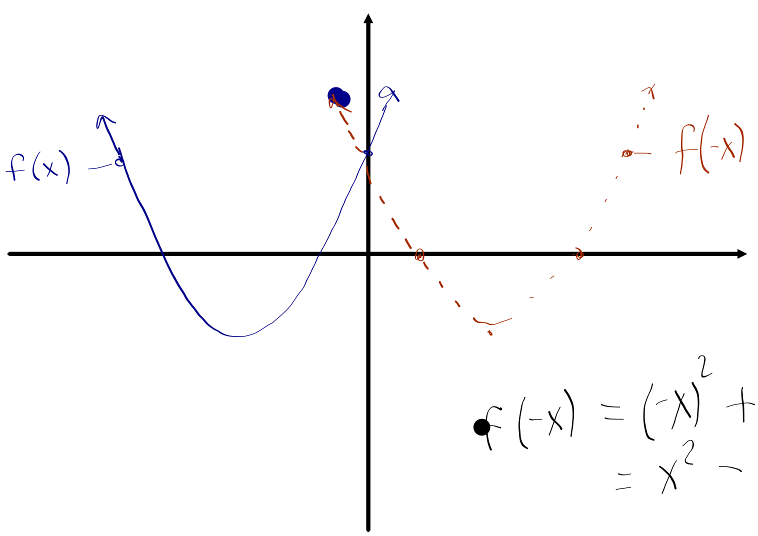
example 8 $f(x) = x^2 + 8x + 7$

$(x)^2 + 8(x) + 7$

Sketch $f(x)$

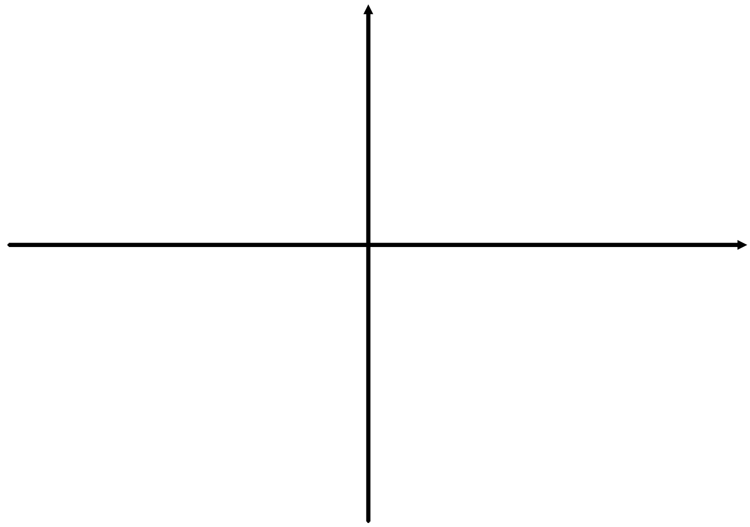


$f(-x) = (-x)^2 + 8(-x) + 7$
$= x^2 - 8x + 7$

example 8

$f(x) = x^2 + 8x + 7$

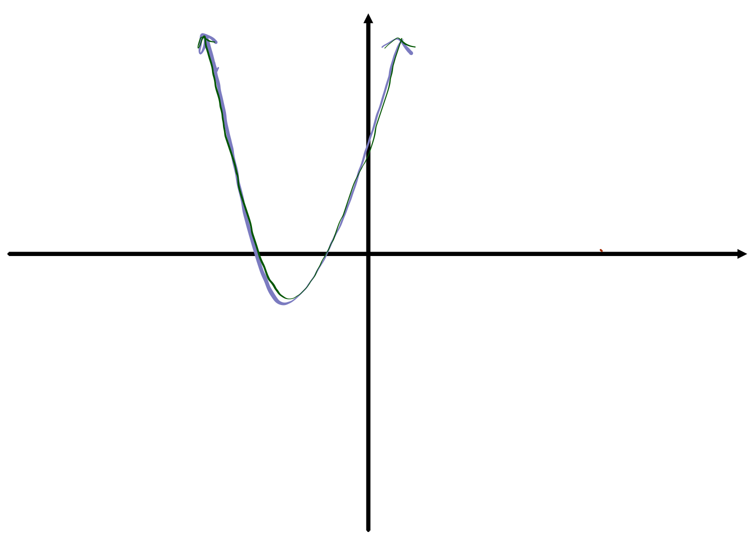
Sketch $f(x)$ and $f(-x)$ and label



example 8

$f(x) = x^2 + 8x + 7$

Sketch $f(x)$ and $f(-x)$ and label



Translating Circles

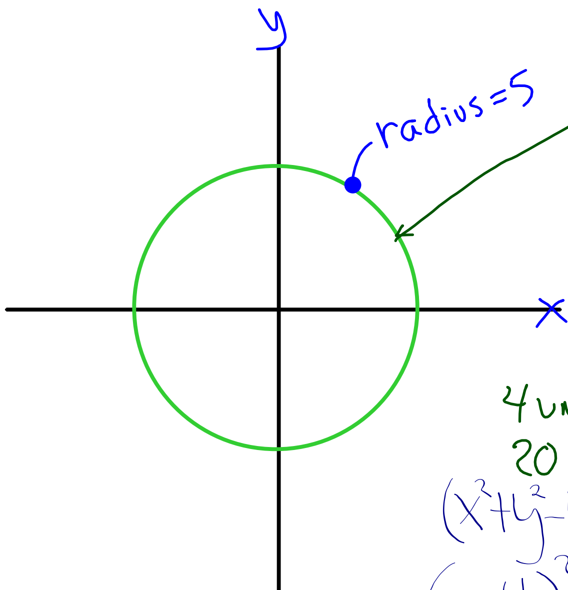
New Title

background

$y - 20 = (x)^2$

y

$x - 8$ $+20$



$x^2 + y^2 = r^2$

$(x)^2 + (y)^2 = 25$

radius squared

4 units →

20 ↑

$(x^2+y^2-4)+20=25$

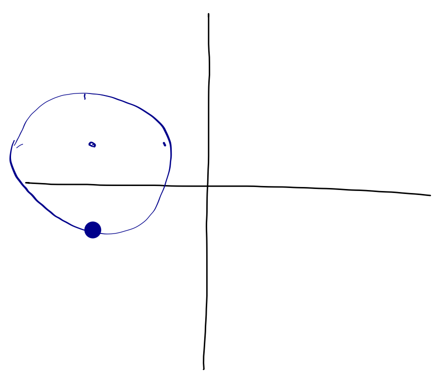
$(x-4)^2+y^2+20=25$

$(x-4)^2+(y-20)^2=25$

Sketch a circle that has the equation......

$(x+3)^2+(y-1)^2=4$

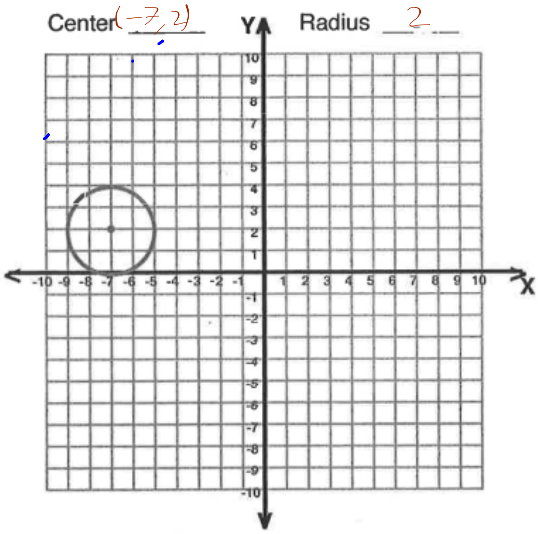
$(x)^2+(y)^2=4$



Identify the center and radius of ea

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

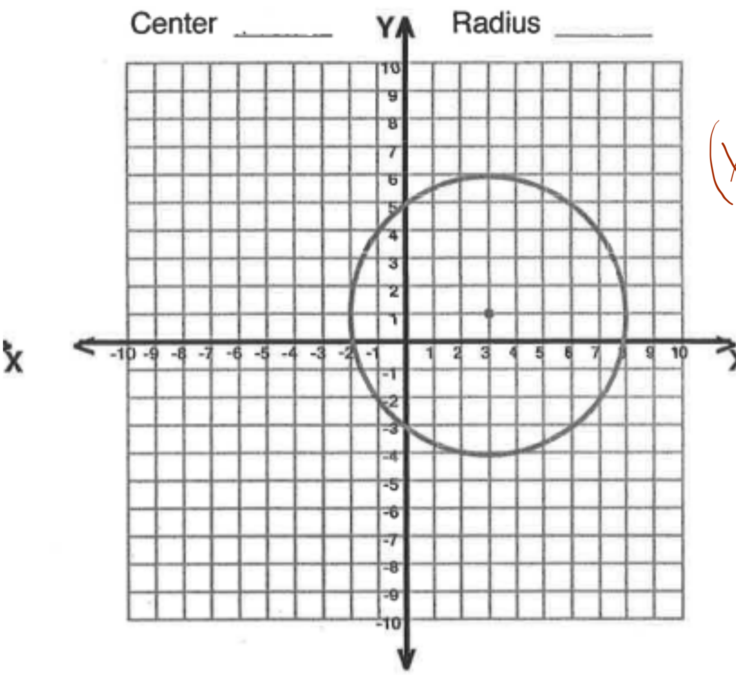
Center $(-7,2)$ Radius 2



$(x+7)^2+(y-2)^2=4$

2) ($)^2$ + ($)^2$ =

Center ______ Radius ______

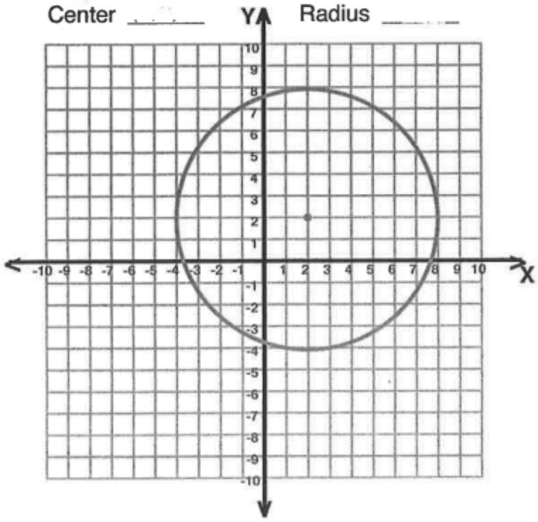


$(x-3)^2+(y-1)^2=25$

$(x-3)^2+y^2=25$

3)

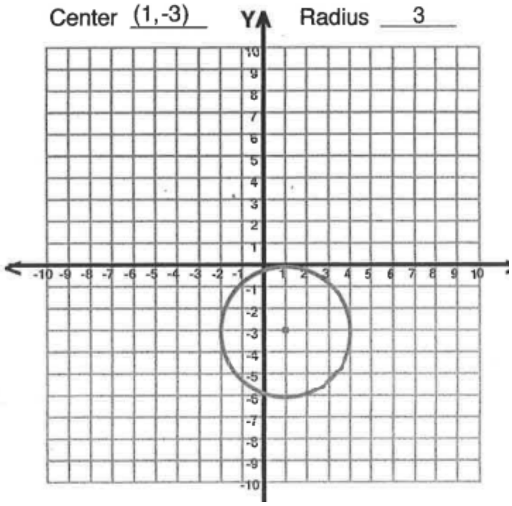
Center ______ Radius ______



$(x-2)^2+(y-2)^2=36$

4)

Center (1,-3) Radius 3



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

Graph

$x^2 + y^2 = 25$ on your calculator

$\sqrt{y^2} = \sqrt{25 - x^2}$

$y = \pm\sqrt{25 - x^2}$

$y = \sqrt{25 - x^2}$

$y = -\sqrt{25 - x^2}$

Graph $(x-4)^2 + (y+5)^2 = 9$

BB

Warm Up #2

(to help review)

Do ~~1~~ 2 3 4

$y = -|x+2| - 1$
only

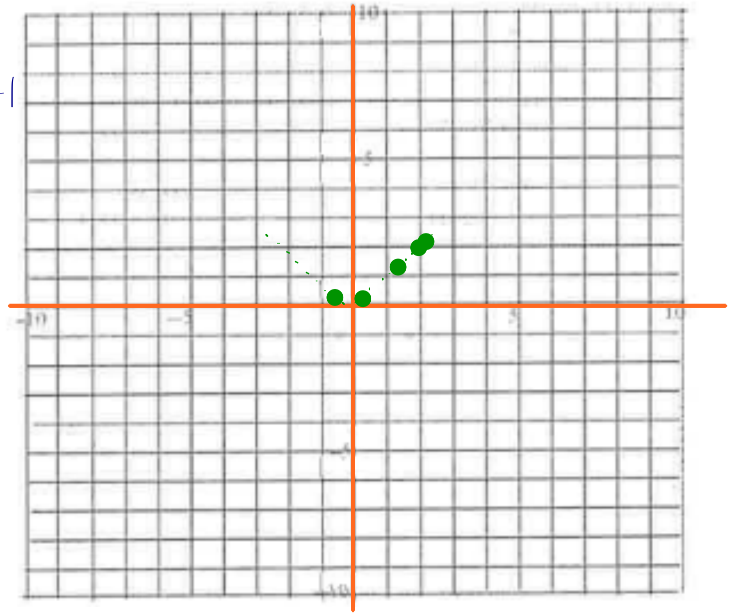
1. Explain the difference between the *graphs* of $f(x) = \frac{1}{x}$ and $g(x) = 4(\frac{1}{x+5})$ +7

g(x) is 7 units higher than f(x),
5 units further left than f(x),
and stretched vertically 4 times more
than f(x)

2. For each of the functions below:

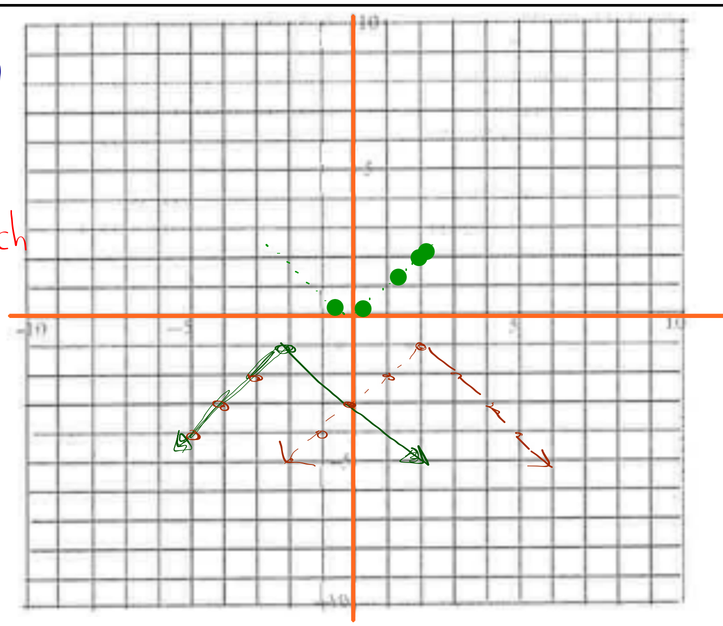
   a. Sketch $y = f(x)$, without your calculator.
   b. Then sketch, with a dashed curve, $f(-x)$. If you were absent last class, this just means to replace every (x) with (-x) in the function.

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



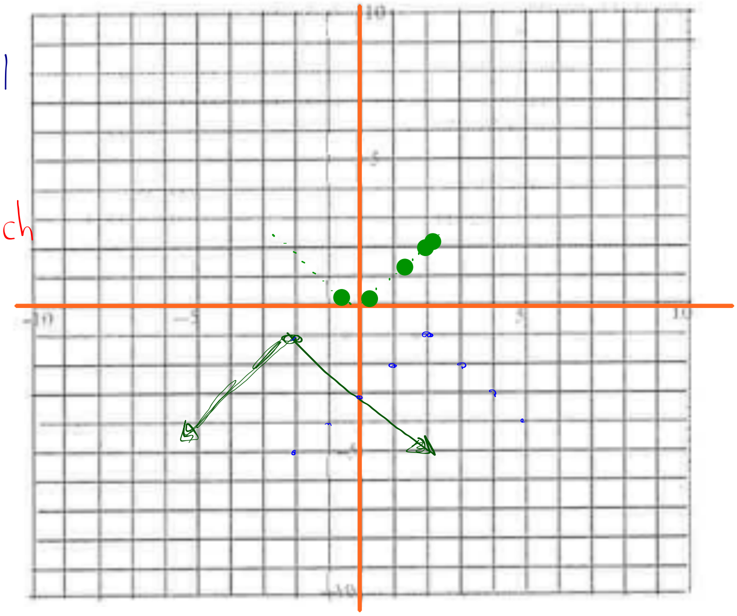
$f(x) = -|x+2| - 1$

then sketch $f(-x)$



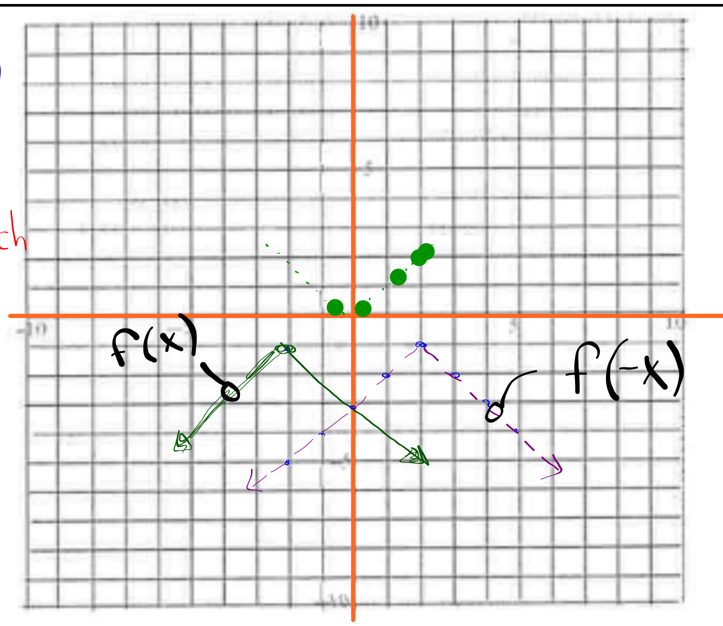
$f(x) = -|x+2| - 1$

then sketch $f(-x)$



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

then sketch $f(-x)$



3. Find the x- and y-intercepts for the following parabolas

a. $y = (x + 12)^2 - 144$

y-int $y = (0+12)^2 - 144$
$= 144 - 144 = 0$

X-intercept(s)

$(x+12)^2 - 144 = 0$

$\sqrt{(x+12)^2} = \sqrt{144}$

$x+12 = \pm 12$

$x+12 = 12$, -12 -12, $x = 0$

$x+12 = -12$, -12 -12, $x = -24$

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

$y = (0-8)^2 - 4$
$= 64 - 4 = 60$

$(x-8)^2 - 4 = 0$

$\sqrt{(x-8)^2} = \sqrt{4}$

$x - 8 = \pm 2$

$x - 8 = 2$, $+8$ $+8$, $x = 10$

$x - 8 = -2$, $+8$ $+8$, $x = 6$

3. Find the x- and y-intercepts for the following parabolas

a. $y = (x + 12)^2 - 144$

y-int
set $x = 0$

$y = (0+12)^2 - 144$
$= 12^2 - 144$
$144 - 144$
0

$(0, 0)$

x-int
Set $y = 0$

$(x+12)^2 - 144 = 0$

$\sqrt{(x+12)^2} = \sqrt{144}$

$x+12 = \pm 12$

$x+12 = 12$, -12 -12, $x = 0$

$x+12 = -12$, -12 -12, $x = -24$

$(0, 0)$ $(-24, 0)$

$y=(x-8)^2-5$

$(x-8)^2-5=0$

$\sqrt{(x-8)^2}=\sqrt{5}$

$x-8=\pm\sqrt{5}$

$x=8\pm\sqrt{5}$

$(8+\sqrt{5}, 0)$

$(8-\sqrt{5}, 0)$

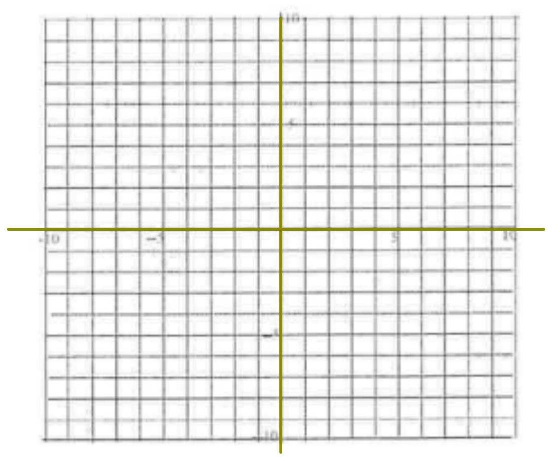
sider the equation $(x-5)^2+(y-8)^2=16$. What can you tell about the graph by looking at the equation?

a. It's a Circle

with a center (5, 8)

and radius is 4

b. Graph it



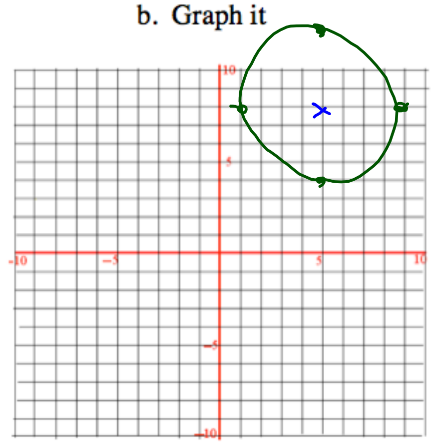
4. Consider the equation $(x-5)^2 + (y-8)^2 = 16$. What can you tell about the graph just by looking at the equation?

a. It's a circle

with a center (5,8)

and radius is 4

b. Graph it



Assignment

2 .... 128a, 129-130, 139, 146a

(3) **Parent Graph Name:** Cubic

a) Parent Equation:

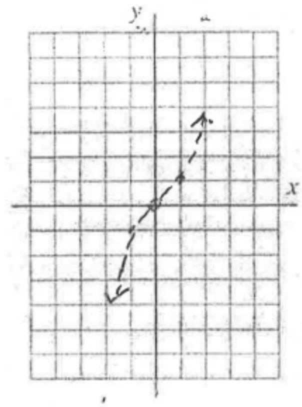
b) Description of Transformation:

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:

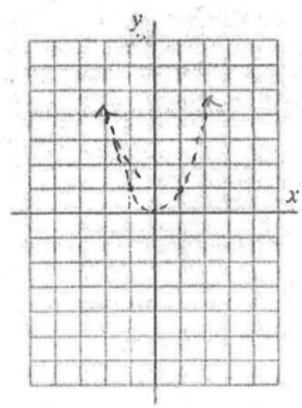
i) Description of Transformation:

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 $T(x)$

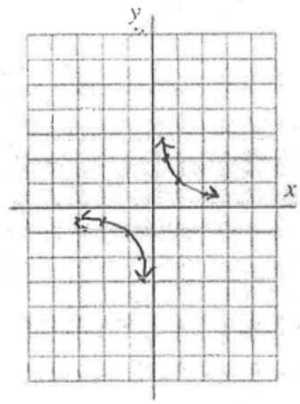
h) Describe any symmetry

(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 $T(x)$

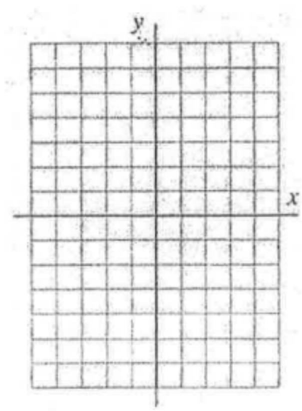
h) Describe any symmetry

(6) **Parent Graph Name:**

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

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 $T(x)$ ____________________

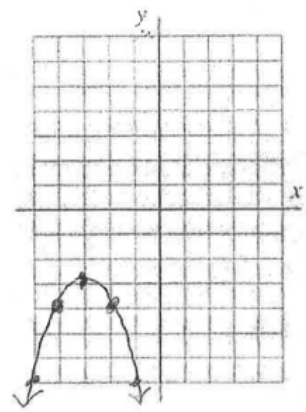
bb) List equation(s) of any asymptotes of $T(x)$

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, $T(x)$

____

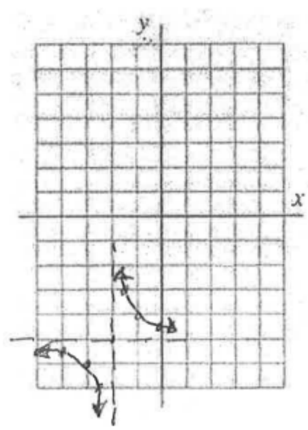
f) List domain of $T(x)$ ________________ List range of $T(x)$ ________________

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

h) Describe any symmetry

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

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

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

3. $(5m^3n^7)(8mn^4)$
Sendler was suspended from the school as a result of her protest against the ____; a form of segregation in the seating of students.
a. $40m^3n^{11}$ gender divide system
b. $40m^4n^{11}$ ghetto-bench system
c. $13m^5n^{10}$ nationalized row system

2. $(a^5b^7)(a^3b^6)$
She studied _______ at Warsaw University.
a. $a^{53}b^{76}$ education
b. $a^{15}b^{42}$ medicine
c. a^8b^{13} Polish literature

4. $(\frac{1}{2}x^5y^3)(4x^2y)(3x)$
During World War II, she served as head of the Jewish children's section of Zegota, an underground ________ organization.
a. $2x^7y^3$ financial aid
b. $6x^8y^4$ resistance
c. $6x^7y^3$ social welfare

5. $(-3x^4)^2$

Undercover as a plumbing specialist, Sendler smuggled Jewish infants out of the ghettos in a ________.

a. $-9x^8$ burlap sack

b. $9x^6$ raincoat

c. $9x^8$ tool box

7. $(5xy^3)^2(2x^5y^2)^3$

When she was discovered by the Nazis she was beaten and suffered _______.

a. $200x^{17}y^{12}$ broken arms and legs

b. $10x^{12}y^{10}$ internal bleeding

c. $150x^{15}y^{14}$ loss of hearing

6. $(\frac{1}{4}a^4b^5)^2$

With the assistance of other Zegota members, Sendler saved roughly ______ Jewish children during the Holocaust.

a. $\frac{1}{4}a^8b^{10}$ 25

b. $16a^6b^7$ 250

c. $\frac{1}{16}a^8b^{10}$ 2,500

8. $(\frac{1}{2}m^3n^2)^2(8mn)(-2m^4n^6)$

In 1999, high school students in Kansas staged a play based on Sendler's life, titled ________, which was adapted to a Hollywood film.

a. $4m^8n^6$ *Holocaust Heroine*

b. $-4m^{11}n^{11}$ *Life in a Jar*

c. $-8m^{14}n^{12}$ *Underwraps*

b)