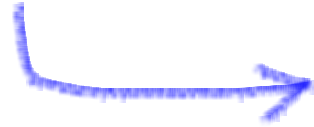


Find your seat  
(sit in the exact seat you are assigned 😊)

QUESTIONS ON HW



Then  
Pick Up  
the  
Warm Up

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

a)  $g\left(\frac{1}{2}\right) = \left(\frac{1}{2}\right)^2 - 5$   
 $= \frac{1}{2} \cdot \frac{1}{2} - 5 = \frac{1}{4} - 5$   
 $= -4.75$

b)  $f(-5) =$   
 $(-5)^2 - 5$   
 $= 25 - 5 = 20$

c)  $g(h+1) = (h+1)^2 - 5$   
 $= (h+1)(h+1) - 5$   
 $h^2 + h + h + 1 - 5 = h^2 + 2h - 4$

c)  $g(\underline{h+1}) =$

$$\begin{aligned} & (h+1)^2 - 5 \\ & (h+1)(h+1) - 5 \\ & h^2 + h + h + 1 - 5 = \boxed{h^2 + 2h - 4} \end{aligned}$$

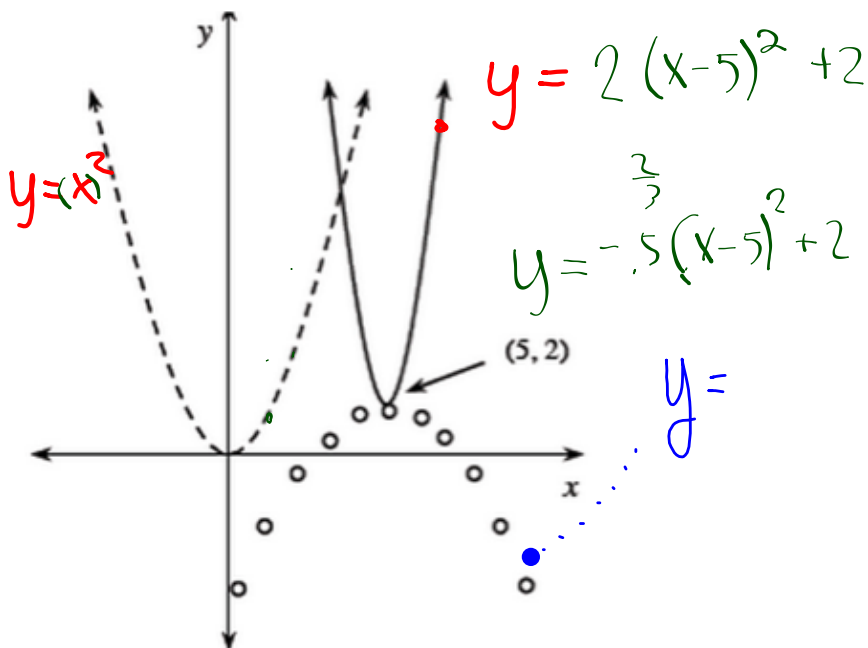
$$(x+7)^2 \neq x^2 + 49$$

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

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

$$= x^2 + 14x + 49$$

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

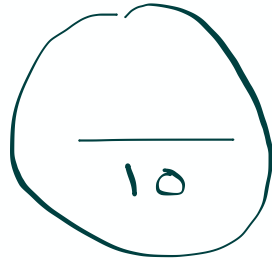


- 3.** Write each expression below in simplest radical form.

4   9   16   25

$\sqrt{75} + \sqrt{27}$ $\sqrt{25} \cdot \sqrt{3} + \sqrt{9} \cdot \sqrt{3}$ $5\sqrt{3} + 3\sqrt{3}$ $8\sqrt{3}$	$\sqrt{x} + 2\sqrt{x}$ $3\sqrt{x}$	$(\sqrt{12})^2$ $12$	$(3\sqrt{12})^2$ $3^2 \cdot 12^2$ $9 \cdot 12$ $108$
--	------------------------------------	----------------------	--

Yesterday's HW



Compare your HW  
to mine

Today :

Analyze Transformations  
of functions using a new  
transformation.

↑ NOT the title  
of your notes

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  $f(x-h)$  ?

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

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

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

What kind if •

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

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

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

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

NOTES



What type of transformation takes place when you...

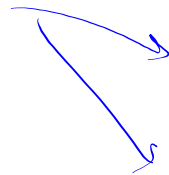
replace  $f(x)$  with  $f(-x)$

$$y = x^3 \quad \text{with} \quad y = (-x)^3$$

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

dark

GDC



$$y_2 = x^3 \quad \text{with} \quad y_1 = (-x)^3$$

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

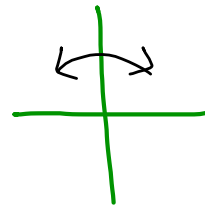
## Summary

## NOTES

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

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

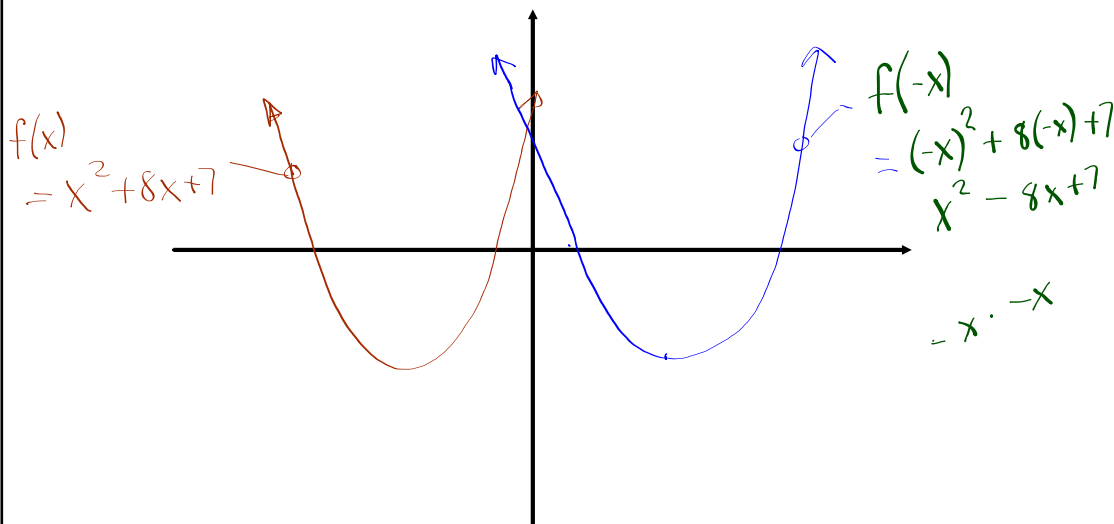
$$y = \frac{1}{x} \Rightarrow y = \frac{1}{(-x)}$$



example 8

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

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





# Translating Circles

New  
Title



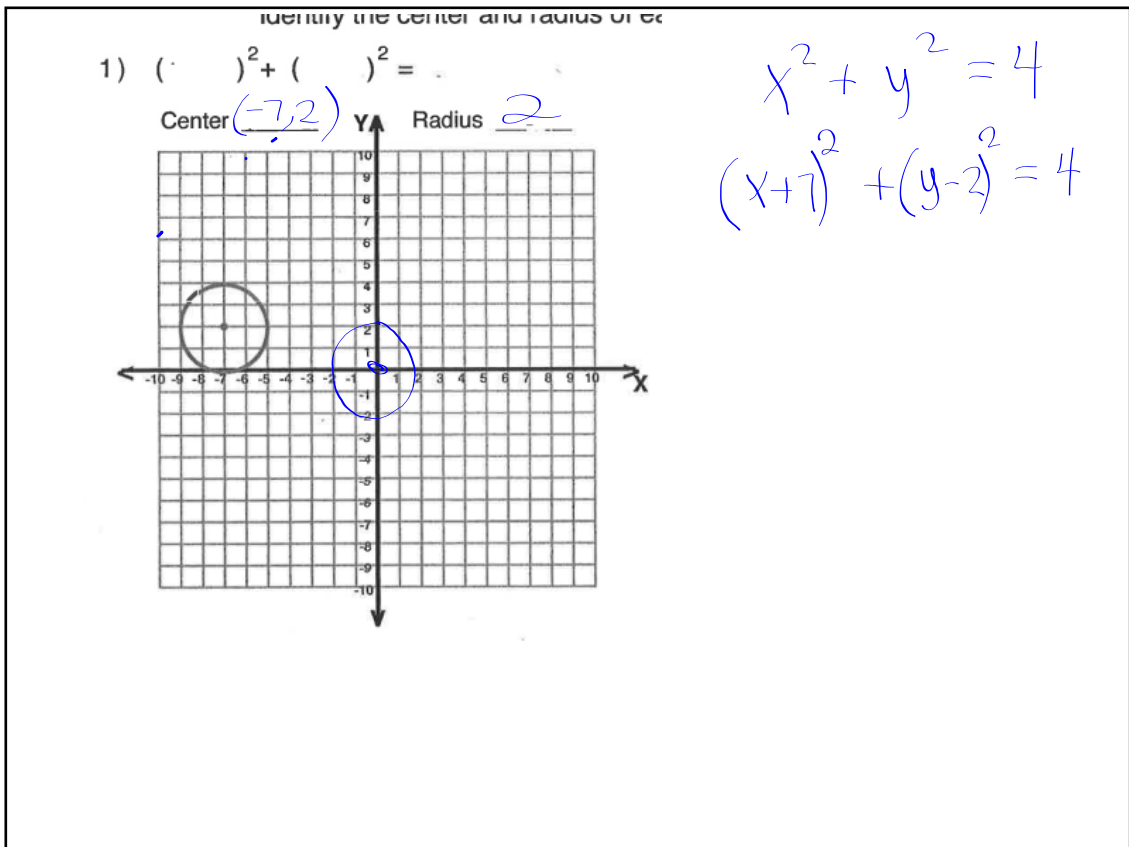
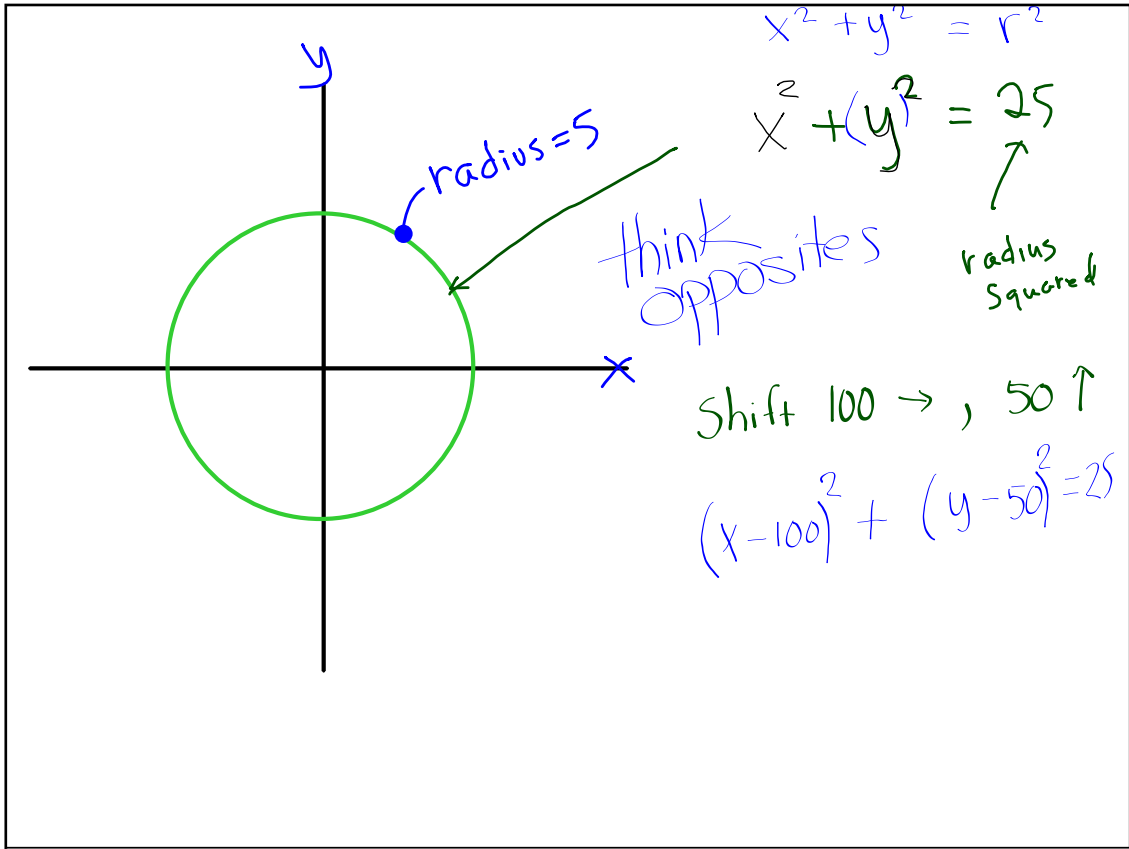
background

$$y = (x)^2$$

$$y - 20$$

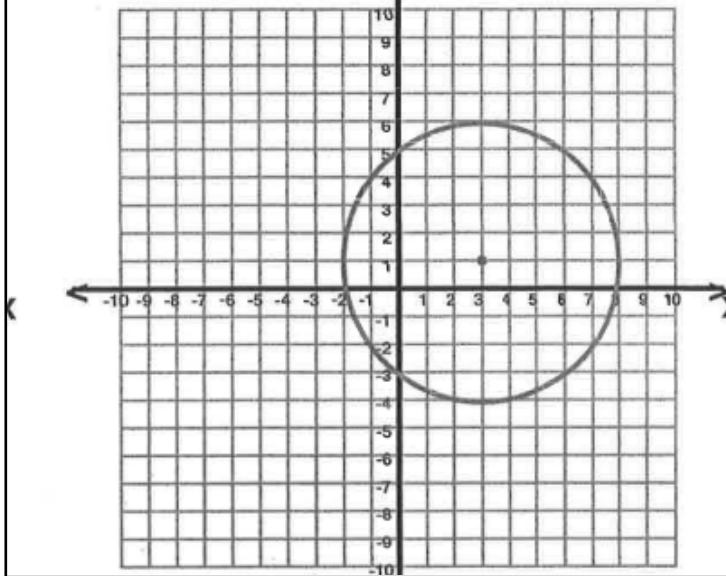
$$x - 8$$

$$+ 20$$



$$2) (x-3)^2 + (y-1)^2 = 2.5$$

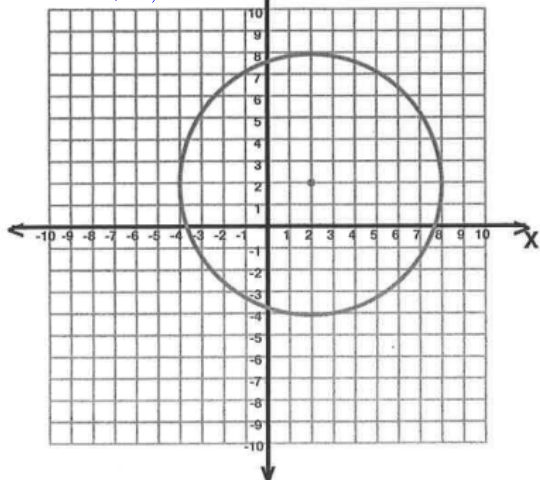
Center  $(3, 1)$  Radius  $5$



3)

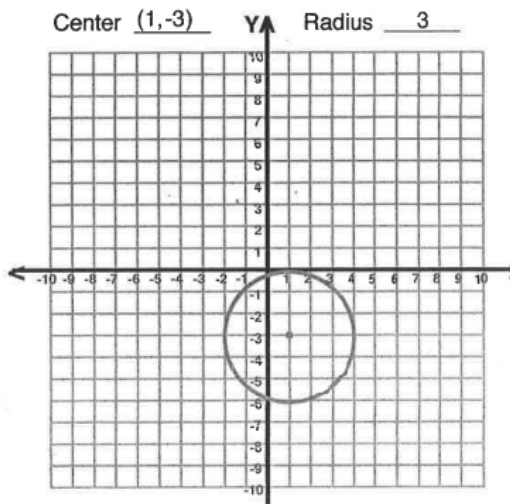
4

Center  $(2, 2)$  Radius  $6$



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

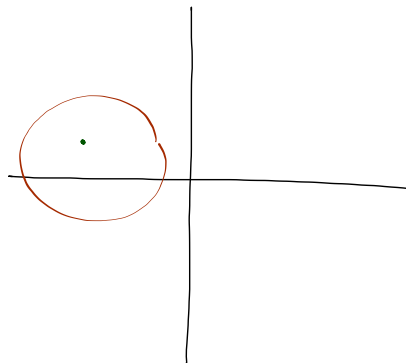
4)



$$(x-1)^2 + (y+3)^2 = 9$$

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

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



Graph

$$x^2 + y^2 = 25 \text{ on your calculator}$$

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

# HW Questions

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.

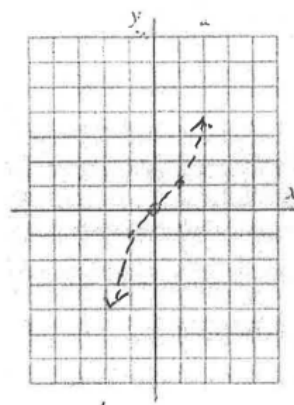
e) Write Transformation function,  $T(x)$

\_\_\_\_\_

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)*

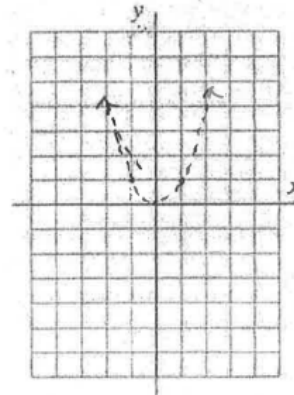
k) Write coordinates of the new locator point.

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,  $T(x)$

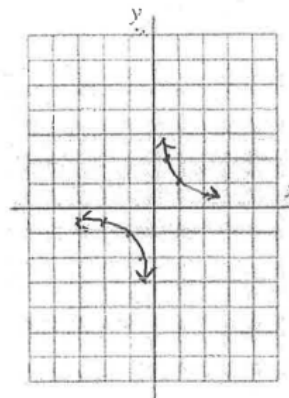
r) Write coordinates of the new locator point.

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)

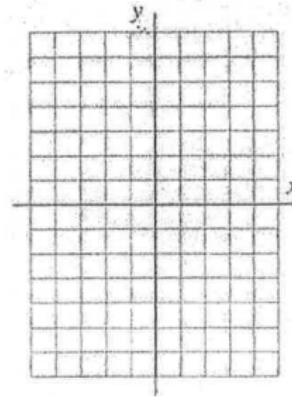
y) Write coordinates of the new locator point.

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.

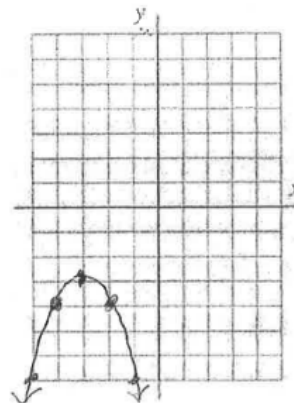
e) Write Transformation function,  $T(x)$

\_\_\_\_\_

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)

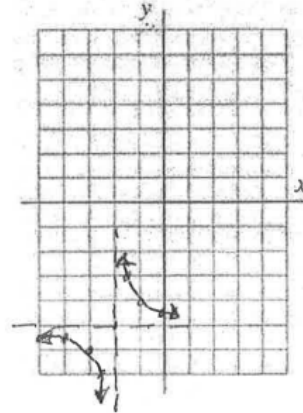
k) Write coordinates of the new locator point.

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 \_\_\_\_\_ 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.
- $a^{53}b^{76}$  education
  - $a^{15}b^{42}$  medicine
  - $a^8b^{13}$  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.
- $2x^7y^3$  financial aid
  - $6x^8y^4$  resistance
  - $6x^7y^3$  social welfare

5.  $(-3x^4)^2$   
 Undercover as a plumbing specialist, Sendler smuggled Jewish infants out of the ghettos in a \_\_\_\_\_.
- $-9x^8$  burlap sack
  - $9x^6$  raincoat
  - $9x^8$  tool box

7.  $(5xy^3)^2(2x^5y^2)^3$   
 When she was discovered by the Nazis she was beaten and suffered \_\_\_\_\_.
- $200x^{17}y^{12}$  broken arms and legs
  - $10x^{12}y^{10}$  internal bleeding
  - $150x^{15}y^{14}$  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.  $16a^8b^7$             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*

Rotate your papers  
clockwise

- Check 3 and 4 for accuracy
- Return papers
- Pick Up Solutions

# Assignment

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

b)