Name **Key**

Period _____ Date _____

Without using your TI describe the transformations from the parent function.

1. $y = |x| + 5$ from $y = |x|$

Up 5

2. $y = (x+5)^2$ from $y = x^2$

left 5

3. $y = (x-3)^2 - 9$ from $y = x^2$

Rignt 3, Down 9

4. $y = \sqrt{x+3} + 5$ from $y = \sqrt{x}$

(left 3, Up 5

5. $y = -\sqrt{x-4} + 2$ from $y = \sqrt{x}$

ROX
Rignt 4
up 2

6. $y = 3|x+2| - 1$ from $y = |x|$

Streten (3)
left 2
Down 1

7. $y = 5 + \frac{3}{4}\sqrt{x-1}$ from $y = \sqrt{x}$

Compression (3/4)
Rignt 1
up 5

8. $y = -5(x+3)^2 - 1$ from $y = x^2$

ROX
Streten (5)
left 3
Down 1

Given the parent function $f(x)$, write the function $g(x)$ with the following transformation.

9. Horizontal shift left 3 units; $f(x) = x^2$

$g(x) = (X+3)^2$

10. Vertical shift down 7 units; $f(x) = |x|$

$g(x) = |X| - 7$

11. Vertical stretch by a factor of 5; $f(x) = \sqrt{x}$

$g(x) = 5\sqrt{X}$

12. Horizontal shift left 5 units, vertical shift up 6 units; $f(x) = x^3$
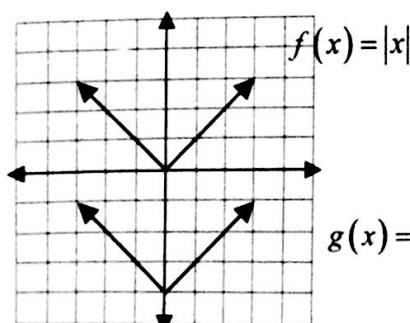
$g(x) = (X+5)^3 + 6$

13. Reflection across the x-axis, horizontal shift right 2 units, vertical shift up 4 units; $f(x) = \sqrt{x}$

$g(x) = -\sqrt{X-2} + 4$

State the transformation(s) from the parent function $f(x)$ to the new function $g(x)$. Then write the function for $g(x)$.

14.

Down 3

$f(x) = |x|$

$g(x) = |X| - 3$

15.

$g(x) = \sqrt{X+3} + 2$

$f(x) = \sqrt{x}$
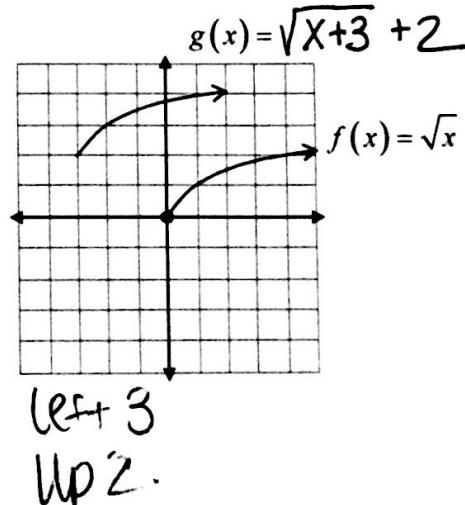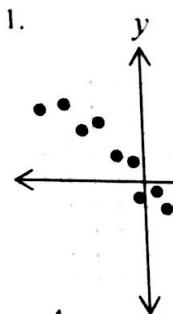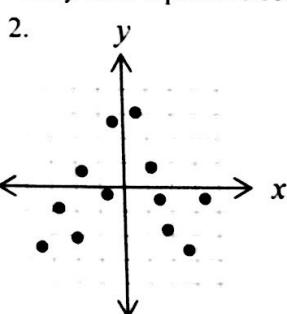
left 3
up 2.
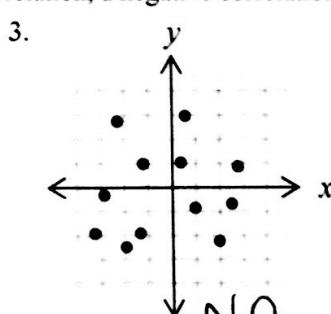
By observation, state whether x and y have a positive correlation, a negative correlation, or no correlation. [Do NOT find r.]

1.

Negative

2.

No correlation

3.

NO correlation

4.
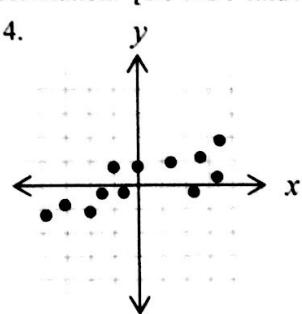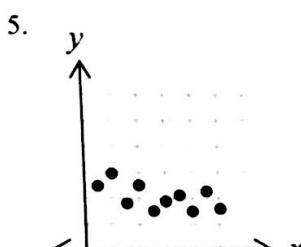
Positive

By observation, match the correlation coefficient with the scatter plot. Explain your reasoning. [Do NOT use your TI.]

$r = 0.93$ $r = 1$ $r = -0.64$ $r = -0.95$

5.

$r = -0.64$

6.

$r = 0.93$

7.

$r = -0.95$

8.

$r = 1$

9.
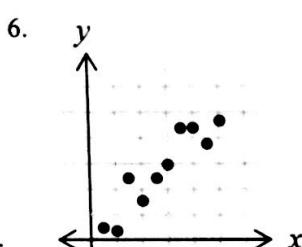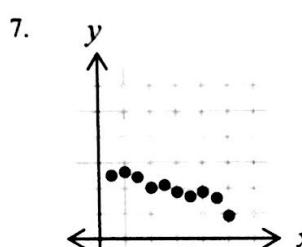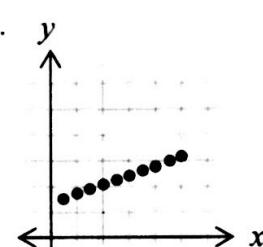
x	8	4	1	5	3	4	9	8	5	2
y	7	6	2	5	2	4	8	8	6	3

a) Create a scatter plot.

b) Describe the correlation. **Positive, Strong**

c) Use your TI to find the least-squares line.
    Round to the nearest 100th.

$$y = 0.79x + 1.24$$

10. The table shows the total amount, m (in millions of dollars), spent by the federal government on mathematics research from 1980 to

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Math Research	$91	$118	$128	$134	$151	$184	$185	$205	$212	$230	$245

a) Find the least-squares line. Let $t = 0$ represent 1980. Round to 3 decimal places.

$$y = 14.964x + 96.364$$

b) Find the correlation coefficient. Describe the correlation.

$$r = 0.993 - \text{Strong, Positive}$$

c) Use the least-squares line to predict the amount the federal government will spend for mathematics research in 1995.