

Tell which family each equation or verbal scenario belongs to. You may say “haven’t learned yet!”

1) $h(x) = |2x - 7| + 10$

2) $g(x) = -\frac{1}{2}(x-4)^2 + 7$

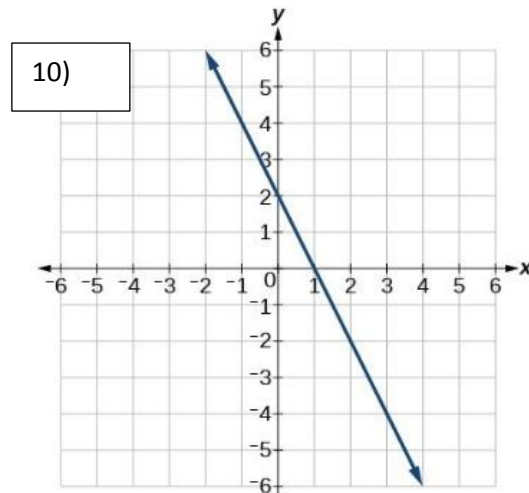
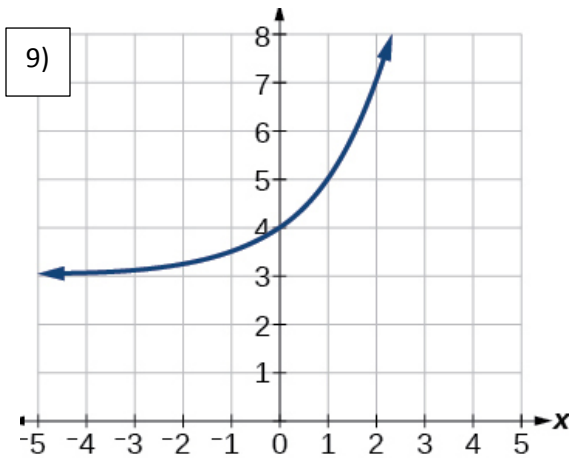
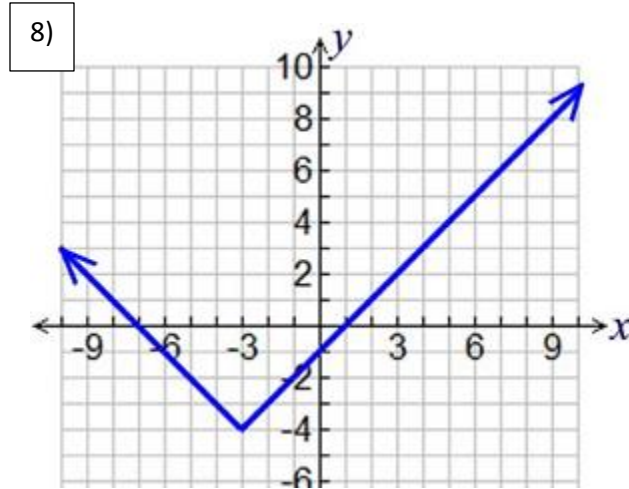
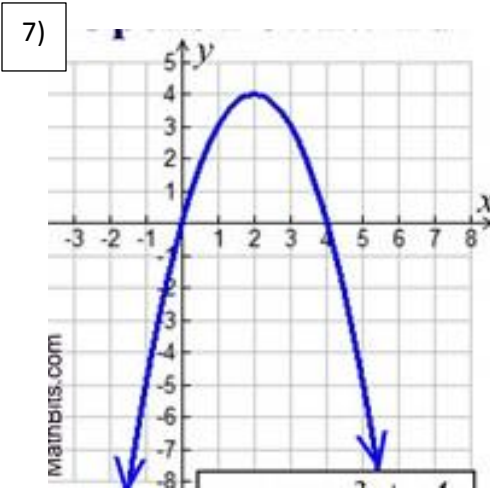
3) $f(x) = -\frac{x}{3} + 4$

4) A high school mathematics teacher measures his height (72 inches) every day for a month.

5) Emily collected 80 pieces of candy from trick or treating. Each day after Halloween, Emily plans to eat half of the candy which she has left.

6) When it snows, teachers in West Fork have a phone tree to contact each other. The principal contacts her two assistant principals. The two assistant principals each contact two teachers. Those teachers each contact two more teachers and so on until all teachers have been contacted.

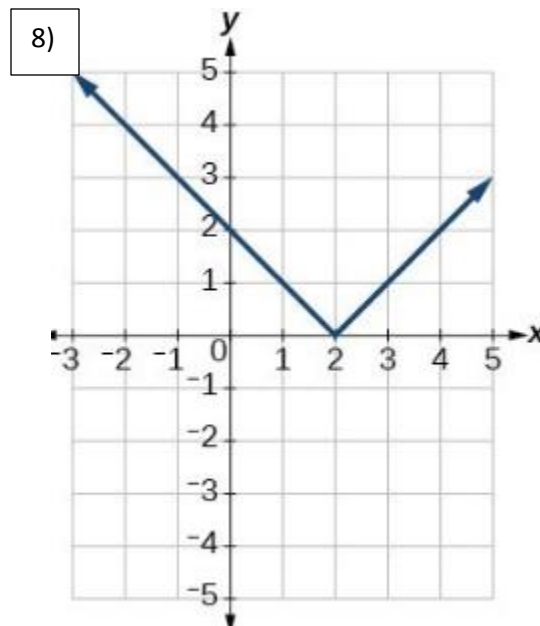
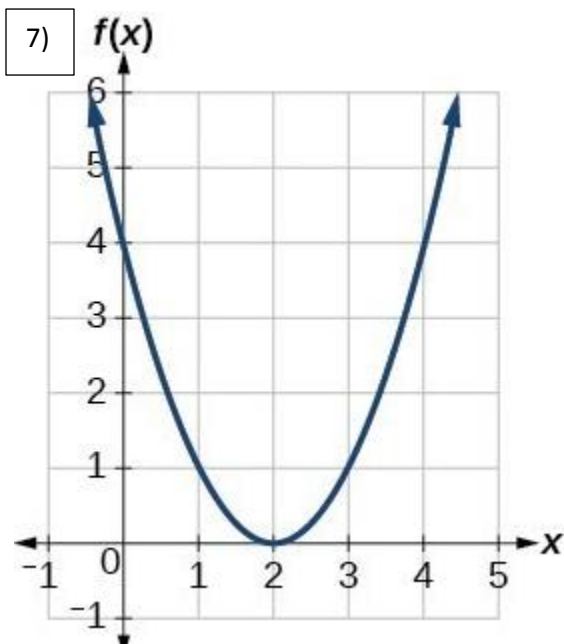
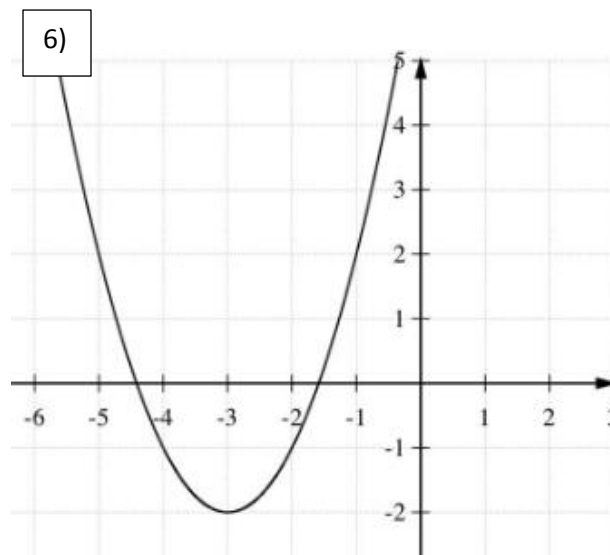
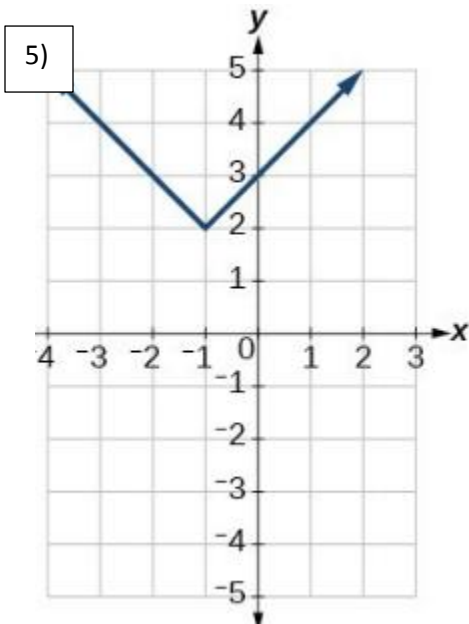
For each graph, tell which family it belongs to. You may say “haven’t learned yet!”
For ALL graphs, give its domain, range, and intervals of increase, decrease, and constant.



Use the given function and the transformation to create the new function.

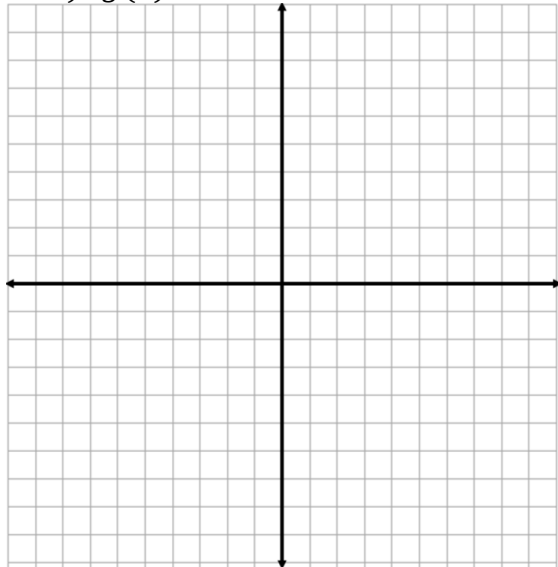
1. $f(x) = 4x$ is shifted three unit down to create $g(x)$.
2. $f(x) = |x| - 6$ is shifted 7 unit right to create $h(x)$.
3. $f(x) = x^2$ is shifted 5 units left and 1 unit up to create $j(x)$.
4. $f(x) = 3 \cdot 5^x$ is shifted 2 units right and 7 units down to create $k(x)$.

Match the graph of each function to its equation. Not all equations will be used.



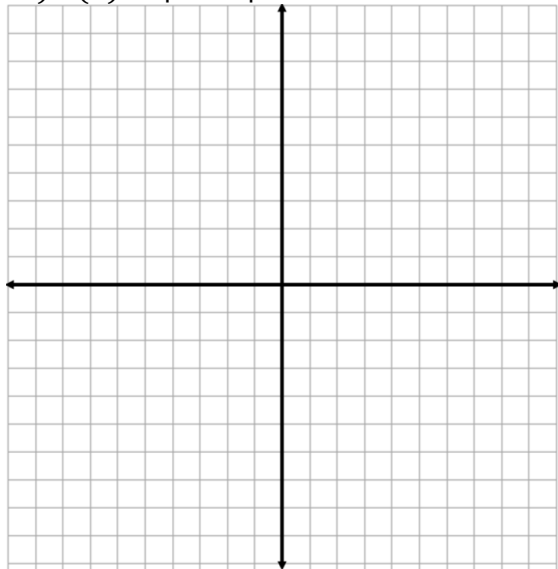
- A) $f(x) = (x - 3)^2 - 2$
- B) $f(x) = |x + 2|$
- C) $f(x) = (x + 3)^2 - 2$
- D) $f(x) = |x| + 2$
- E) $f(x) = (x + 1)^2 + 2$
- F) $f(x) = |x - 2|$
- G) $f(x) = (x - 2)^2$
- H) $f(x) = |x + 1| + 2$
- I) $f(x) = (x + 2)^2$
- J) $f(x) = |x| - 2$

9) $g(x) = x^2 - 1$



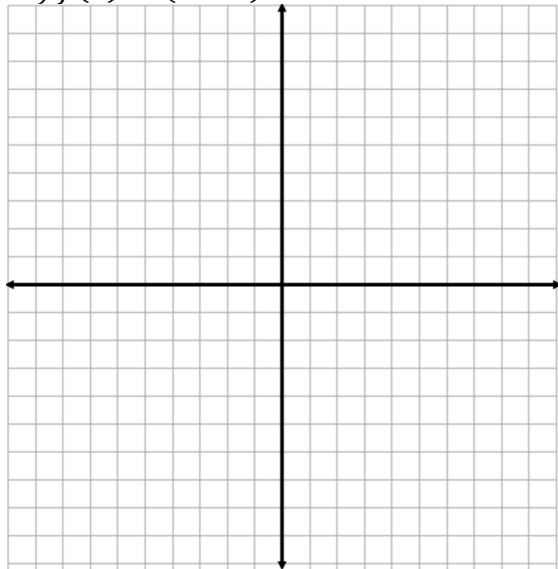
- Describe verbally all transformations to the parent function $f(x) = x^2$
- Determine the y-intercept
- Determine the vertex. Is it a max or min?
- Determine the domain and range
- Determine the axis of symmetry
- How many zeros does the function have? (two, one, or none)
- Sketch the graph

10) $h(x) = |x + 5| - 7$



- Describe verbally all transformations that have occurred to the function $f(x) = |x|$
- Determine the y-intercept
- Determine the domain and range
- How many zeros does the function have?
- Sketch the graph

11) $f(x) = (x - 3)^2 + 1$



- Describe verbally all transformations that occurred to the parent function $y = x^2$
- Determine the y-intercept
- Determine the vertex. Is it a max or min?
- Determine the domain and range
- Determine the axis of symmetry
- How many zeros does the function have? (two, one, or none)
- Sketch the graph

For each quadratic below, tell how the parent function $f(x) = x^2$ has been transformed.

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

2. $y = -3(x - 6)^2 + 9$;

3. $y = -\frac{1}{2}(x - 3)^2 + 6$

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

5. $y = -3(x - 14)^2 + 4$

6. $y = -\frac{1}{2}x^2 + 7$

Write the equation that would produce the following verbal descriptions of a transformed absolute value.

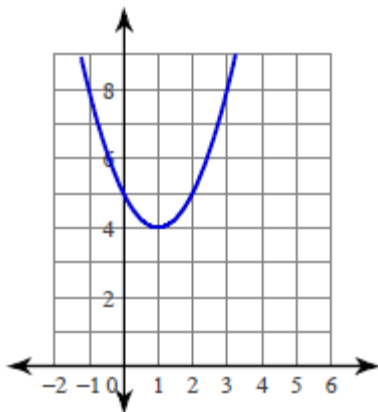
7. Stretched vertically by a factor of 8 translated 7 unit right and 2 units up.

8. Compressed vertically by a factor of $\frac{1}{3}$ reflected over the x axis and moved 2 units left

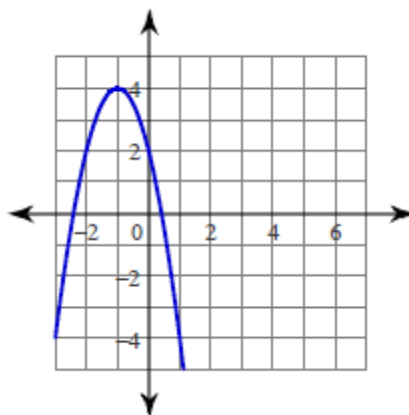
9. Reflected over the x axis and moved 3 units down.

Describe how each graph is a transformation of $y = x^2$.

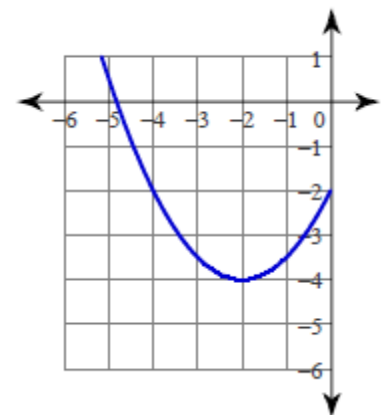
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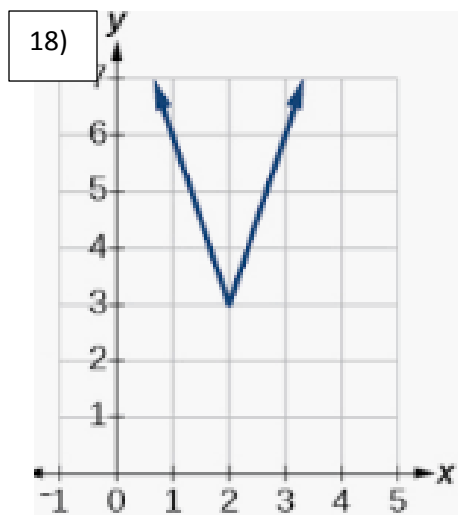
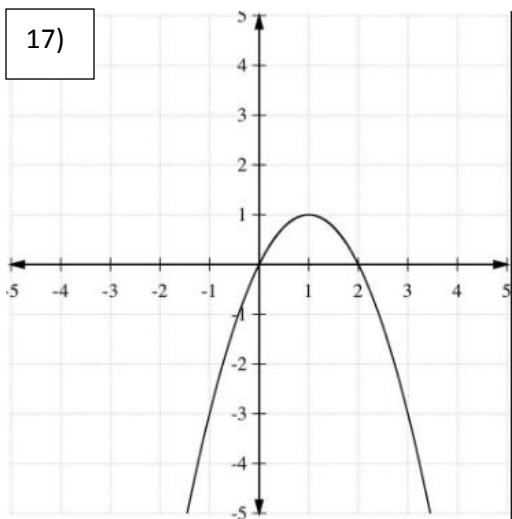
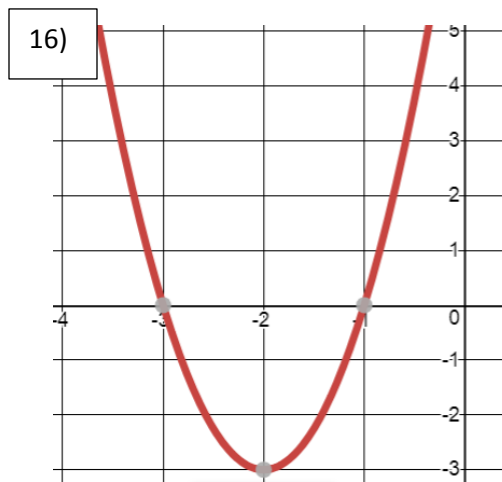
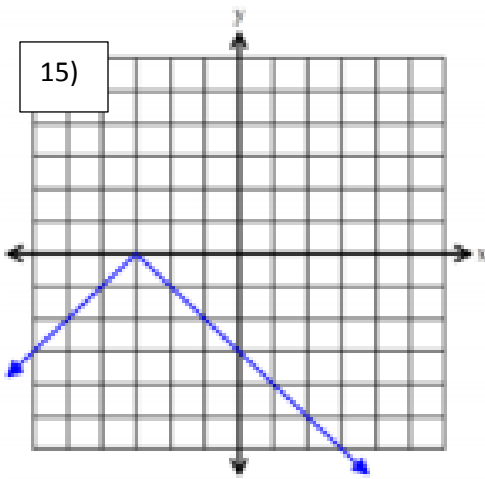
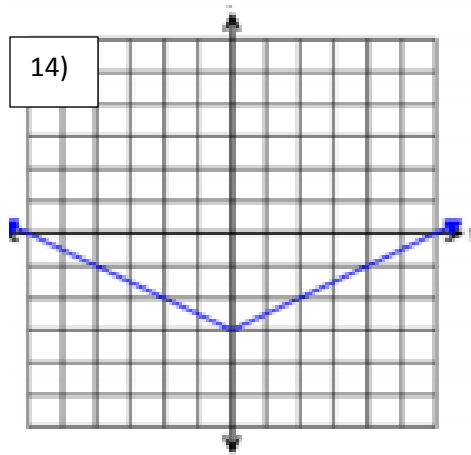
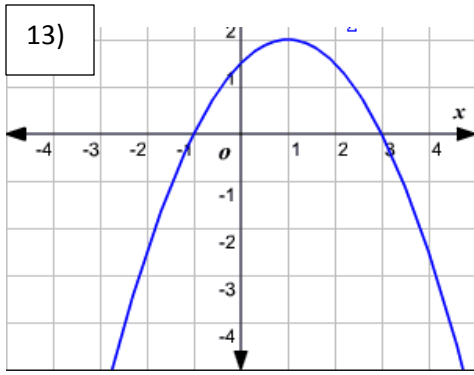
11.



12.



Match the graph to the equation. Not all equations will be used.



- A) $f(x) = (x - 2)^2 - 3$
- B) $f(x) = -|x + 3|$
- C) $f(x) = -\frac{1}{2}(x - 1)^2 + 2$
- D) $f(x) = 2|x| - 3$
- E) $f(x) = \frac{1}{2}(x + 1)^2 + 2$
- F) $f(x) = \frac{1}{2}|x| - 3$
- G) $f(x) = 3(x + 2)^2 - 3$
- H) $f(x) = -|x - 3|$
- I) $f(x) = -(x - 1)^2 + 1$
- J) $f(x) = -\frac{1}{2}|x - 1| + 2$
- K) $f(x) = -(x + 1)^2 + 1$
- L) $f(x) = 3|x - 2| + 3$

Name: _____ Date: _____

#60 Solutions and Graphs

Solve each of the following and explain why your answer makes sense in relation to the graph. **A sketch is required to aid your explanation.**

(Remember to solve a function means set the function equal to zero.)

Do all work on your own paper.

1) $f(x) = 2(x + 5)^2 - 8$

2) $f(x) = |x - 7|$

3) $14 = (x - 3)^2 + 20$

4) $6 = -\frac{1}{3}|x + 2| + 10$

5) $-2 = 5|x - 4| + 8$

6) $f(x) = \frac{3}{4}(x + 2)^2$

7) $f(x) = 4|x + 5| - 20$

8) $f(x) = |x - 3| - 2$

9) $-4 = -2(x + 4)^2 - 2$

10) $7 = -|x - 8| + 7$

Name: _____ Date: _____

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10) $7 = -|x - 8| + 7$

Name: _____ Date: _____

#61 Function Family from a Table

Show work to identify each table as linear (or absolute value if definite), quadratic, or none of these. If it is linear, write the equation. (You can try to write the equation of the absolute value.)

1.

x	-3	-2	-1	0	1	2	3
y	14	10	6	2	-2	-6	-10

2.

x	-3	-2	-1	0	1	2	3
y	$\frac{1}{2}$	1	2	4	8	16	32

3.

x	-3	-2	-1	0	1	2	3
y	21	12	5	0	-3	-4	-3

4.

x	-3	-2	-1	0	1	2	3
y	-16	-13	-10	-7	-4	-7	-10

5.

x	-3	-2	-1	0	1	2	3
y	-14	-9	-4	1	6	11	16

6.

x	-3	-2	-1	0	1	2	3
y	-18	-6	-2	0	2	6	18

7.

x	-3	-2	-1	0	1	2	3
y	4	8	16	32	64	128	256

8.

x	-3	-2	-1	0	1	2	3
y	$\frac{1}{27}$	$\frac{1}{9}$	$\frac{1}{3}$	1	3	9	27

More on the back!

9.

x	-3	-2	-1	0	1	2	3
y	30	20	12	6	2	0	0

10.

x	-3	-2	-1	0	1	2	3
y	11	9	7	5	3	1	-1

11.

x	-3	-2	-1	0	1	2	3
y	1	0	-1	-2	-1	0	1

12.

x	-3	-2	-1	0	1	2	3
y	-27	-9	-3	0	3	9	27

13.

x	-3	-2	-1	0	1	2	3
y	0	5	8	9	8	5	0

14.

x	-3	-2	-1	0	1	2	3
y	3	0	-1	0	3	8	15