

When we did our graphing during class, all our graphs were LINEAR EQUATIONS ($y = mx + b$).

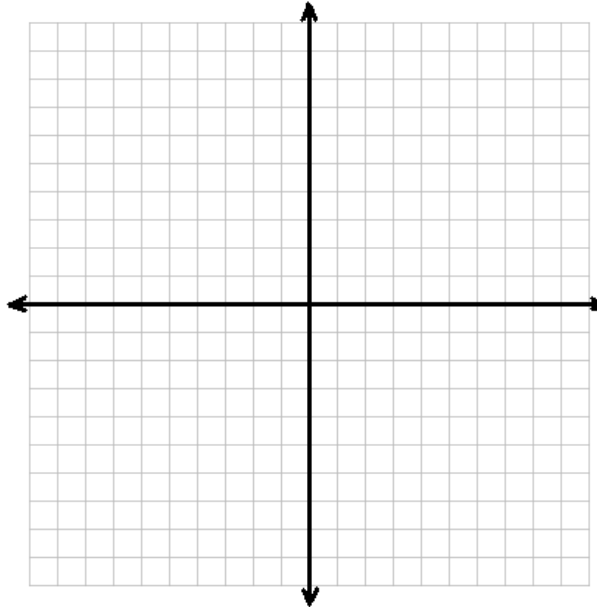
Since they were linear equations, they had a slope (m) that did not change. We were able to write the y -intercept and use the slope to count boxes and plot points.

For instance:

Graph $y = -3x + 7$

$$m = \frac{-3}{1} = \frac{\Delta y}{\Delta x} = \frac{\text{down } 3}{\text{right } 1}$$

y -int: (0,7)



Now that we have to graph functions (or equations) that are non-linear, we can't just count boxes because non-linear functions do not have constant slopes. So we will have to use a table of values. Before you panic and say, "How am I going to do that?" or "Now I have to do all the computations to figure out the points!!!"... take a breath. Your calculators will give you the table if you use the **y =** button and **2nd Table**. So all you have to do is:

- 1) Enter the equation into the $y =$ screen [f(x)]
- 2) Copy the table (pick all the points that fit from -10 to +10)
- 3) Plot the points.
- 4) Try your best to make a nice smooth curve to connect the dots.

Use the examples on the next page:

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Alg1

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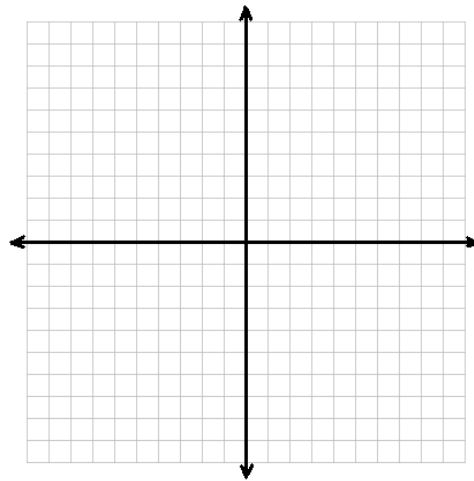
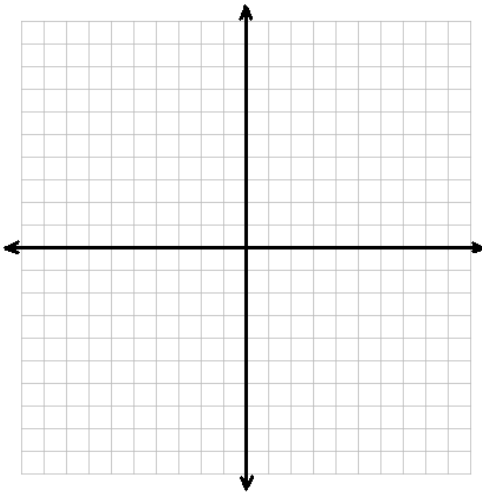
Graphing Functions

Quadratic Equation (x^2):

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

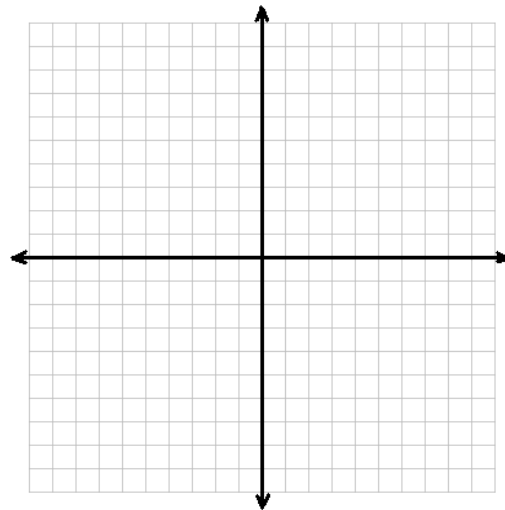
Absolute Value Function [$|x|$]

$$f(x) = |2x - 6|$$



Exponential Function (variable is in the exponent 4^x)

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

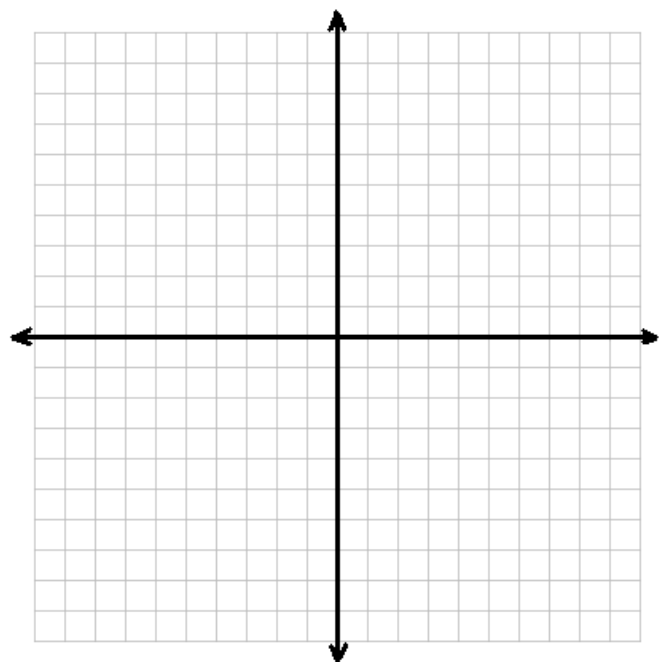
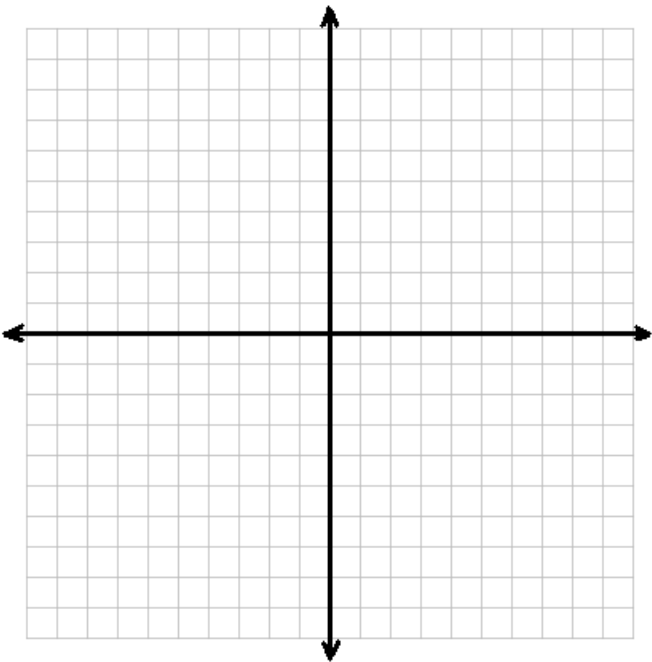


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Graph each function:

1) $y = x^2$

2) $y = -x^2$



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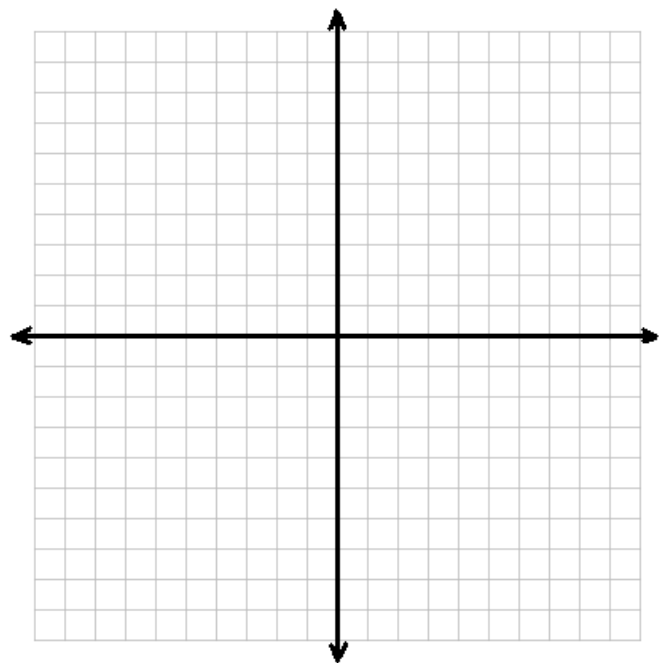
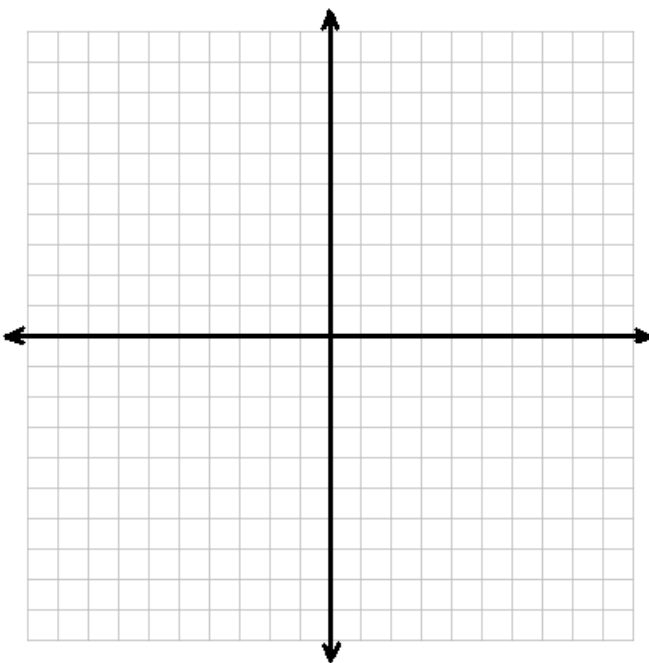
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Graphing Functions

3) $y = x^2 + 1$

4) $y = x^2 - 5$

Describe how the graph shifted from the original ($y = x^2$):

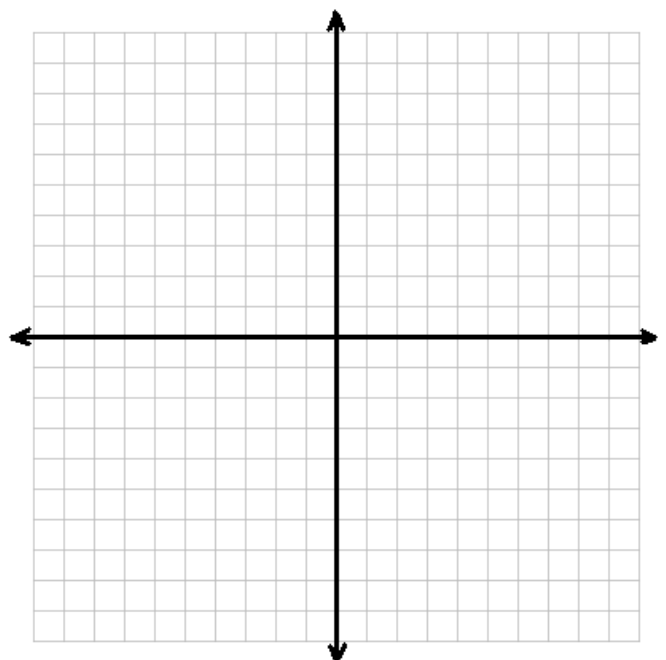
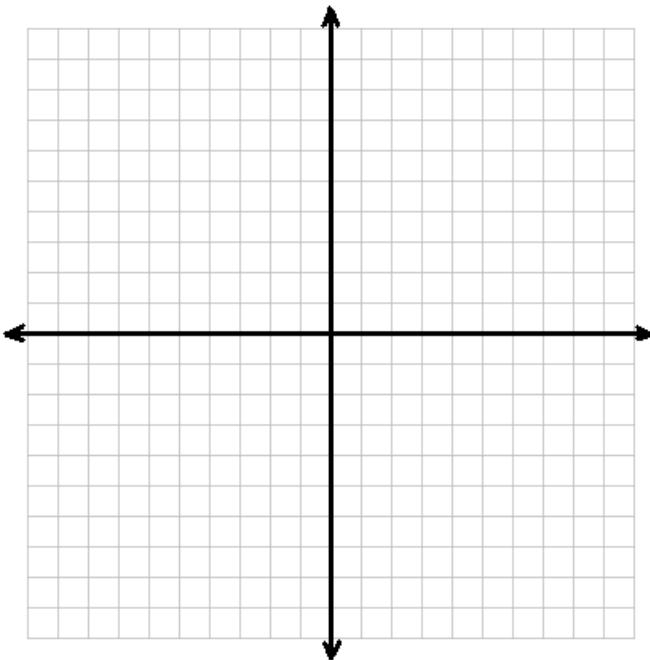


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5) $y = (x+3)^2$

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

Describe how the graph shifted from the original ($y = x^2$):

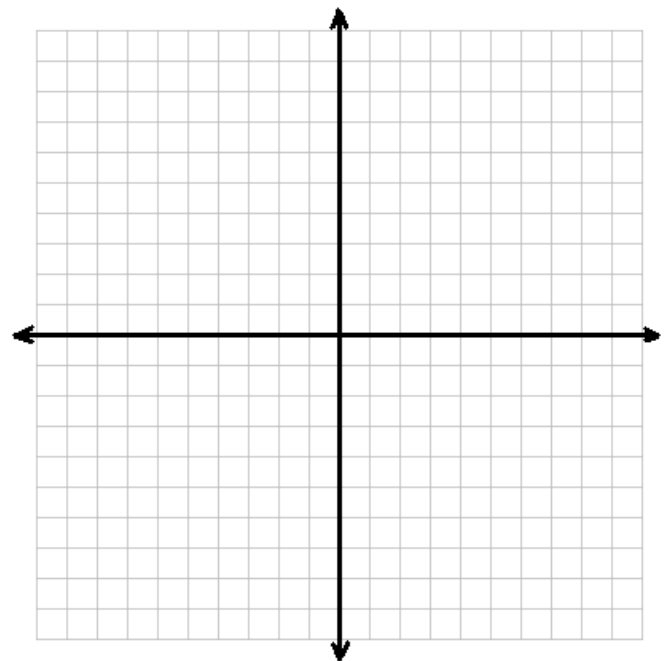
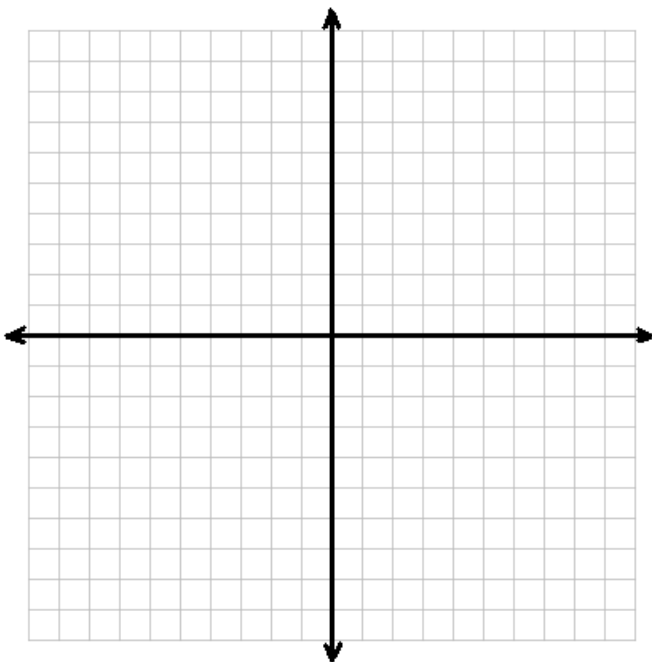


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7) Graph $y = |x|$

8) $y = -|x|$



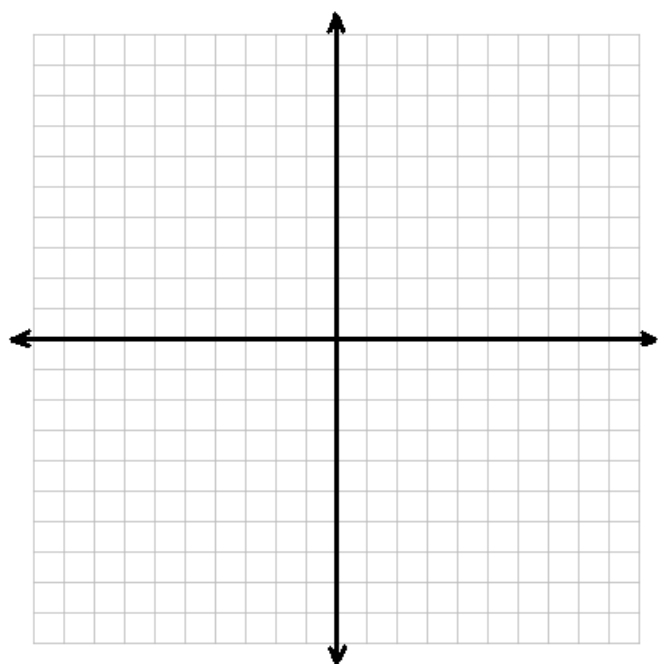
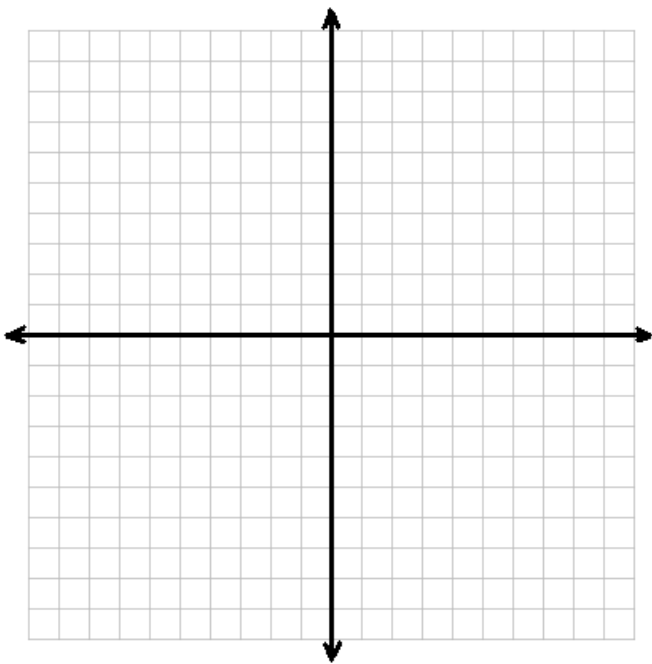
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9) $y = |x| - 4$

10) $y = |x| + 5$

Describe how the graph shifted from the original ($y = |x|$):

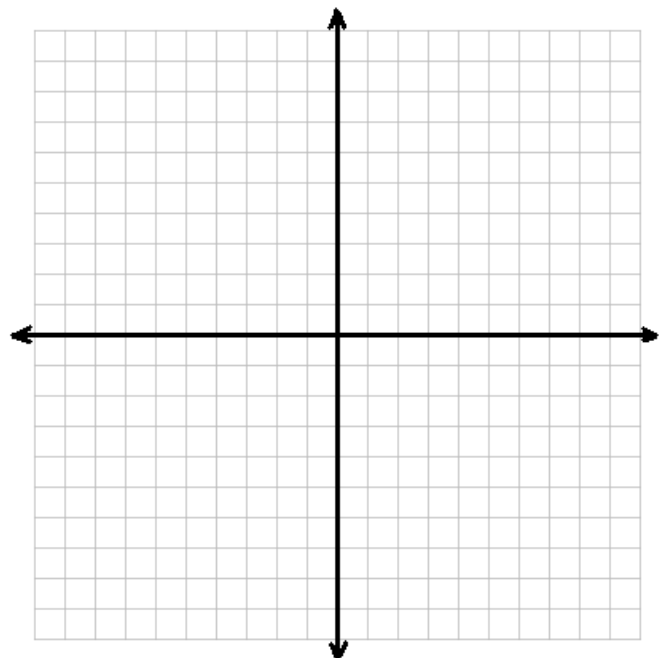
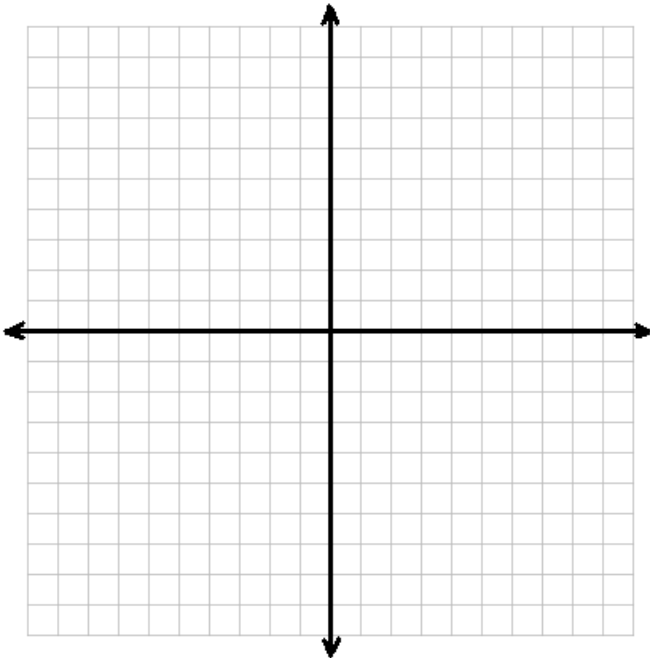


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11) $y = |x - 5|$

12) $y = |x + 4|$

Describe how the graph shifted from the original ($y = |x|$):



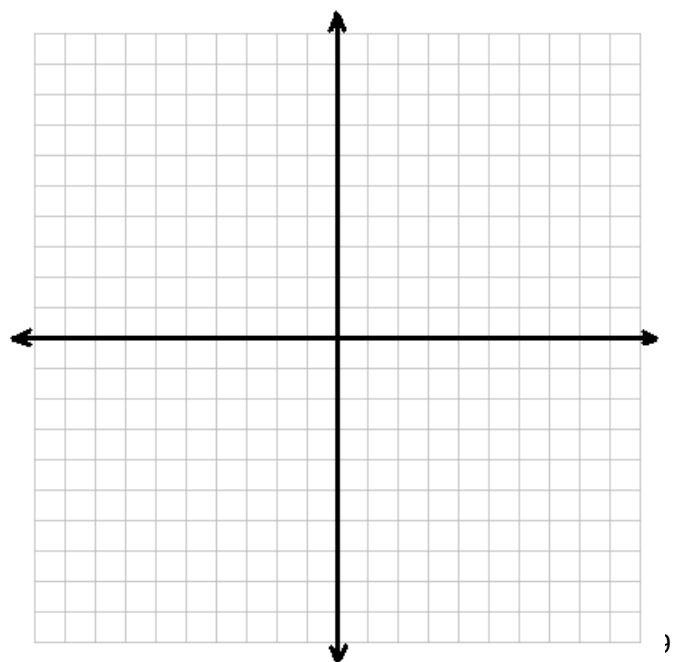
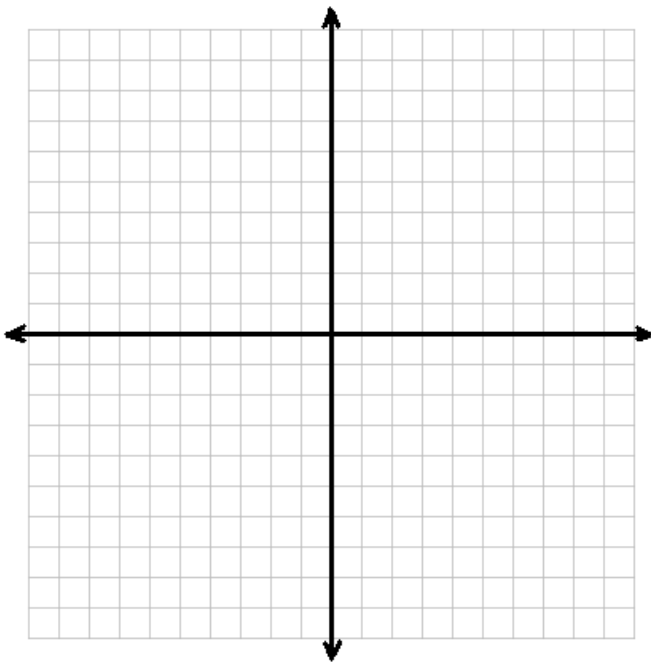
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13) $y = |2x|$

14) $y = |x - 5| - 4$

Describe how the graph shifted from the original ($y = |x|$):

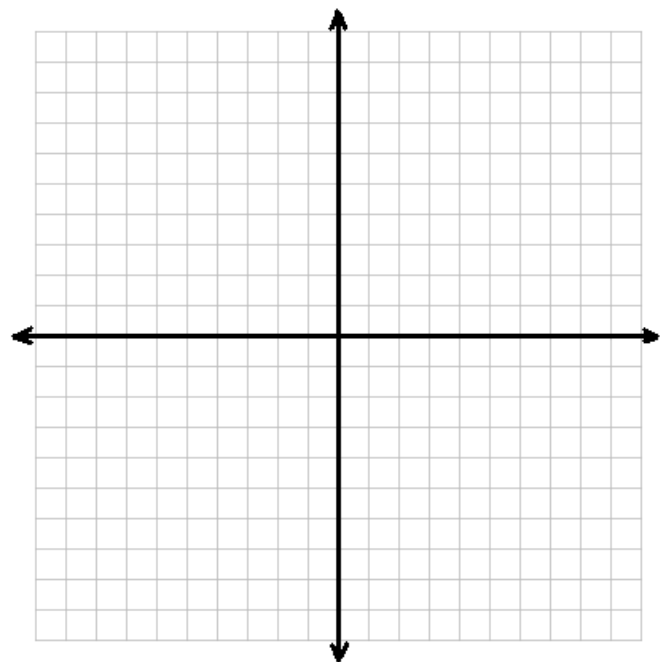
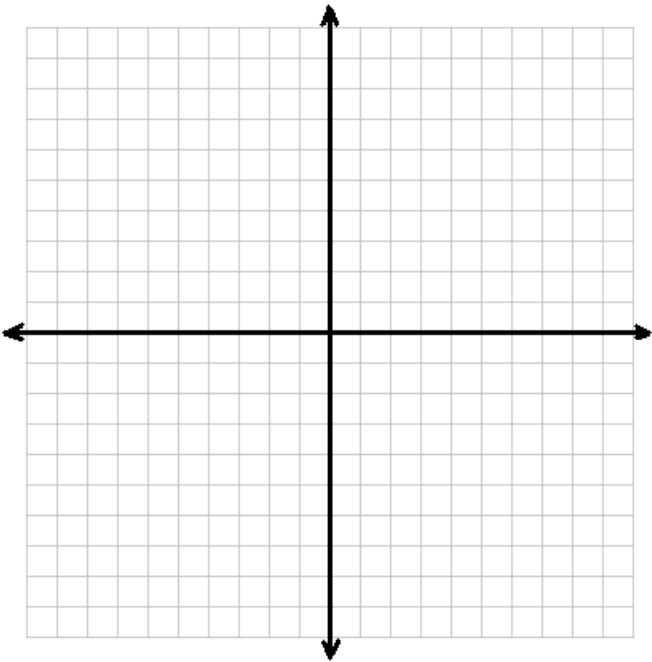


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15) Graph $y = 2^x$

16) graph $y = (\frac{1}{2})^x$

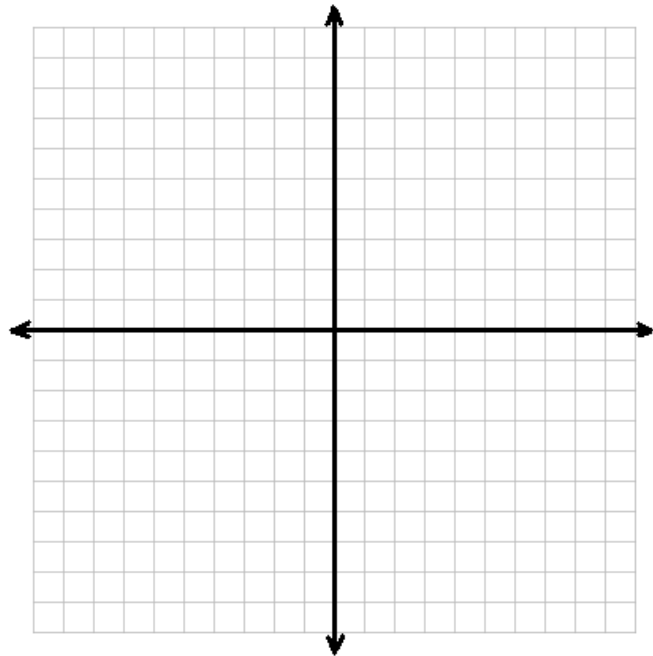
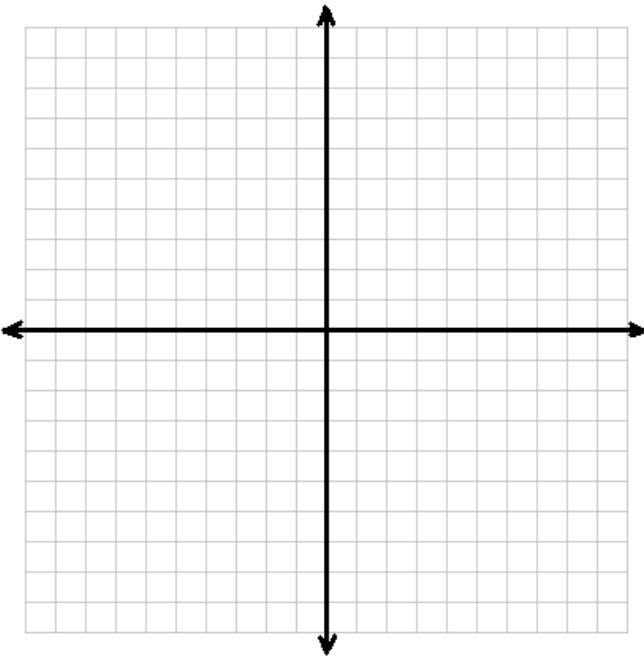


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17) $f(x) = -| \frac{1}{2} x + 4 | + 5$

18) $f(x) = 3^x$

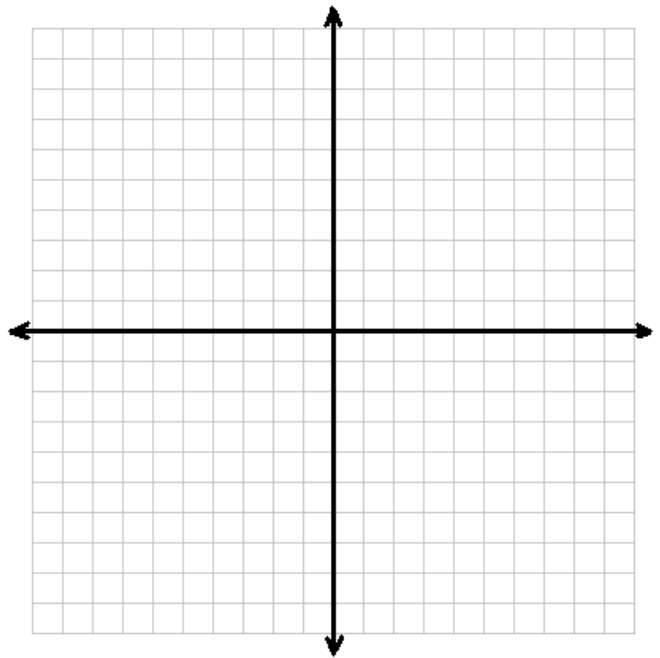
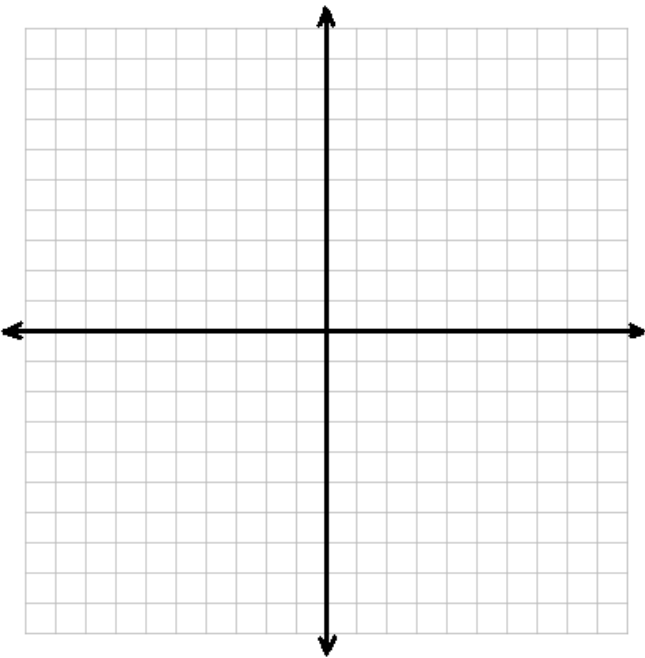


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Graph each function:

19) $f(x) = (\frac{1}{3})^x$

20) $f(x) = 3^x - 5$

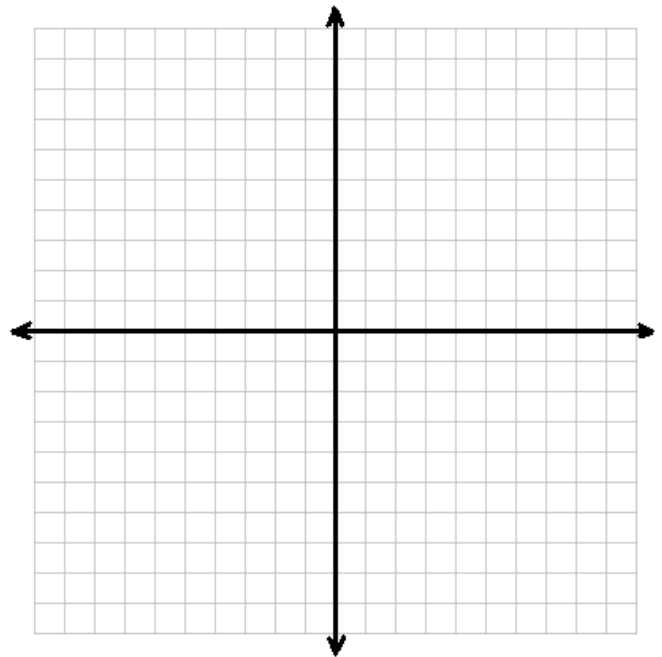
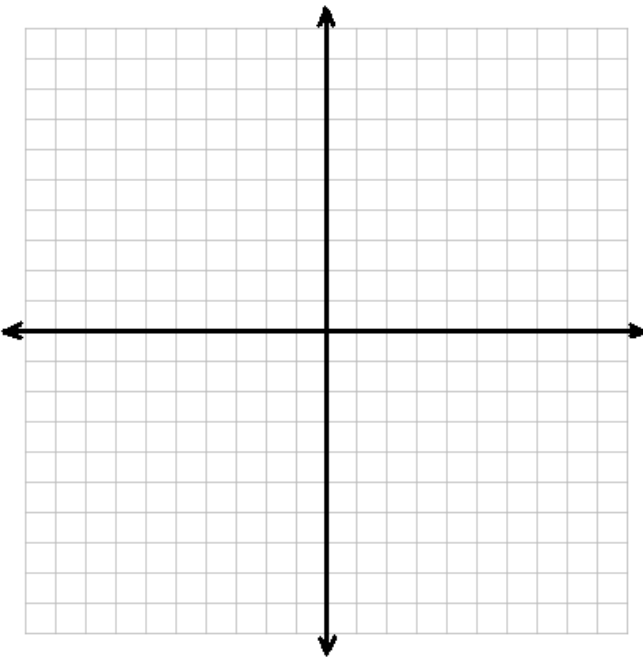


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Graph each function:

21) $f(x) = (x+2)^2 + 1$

22) $f(x) = (x - 1)^2 - 6$

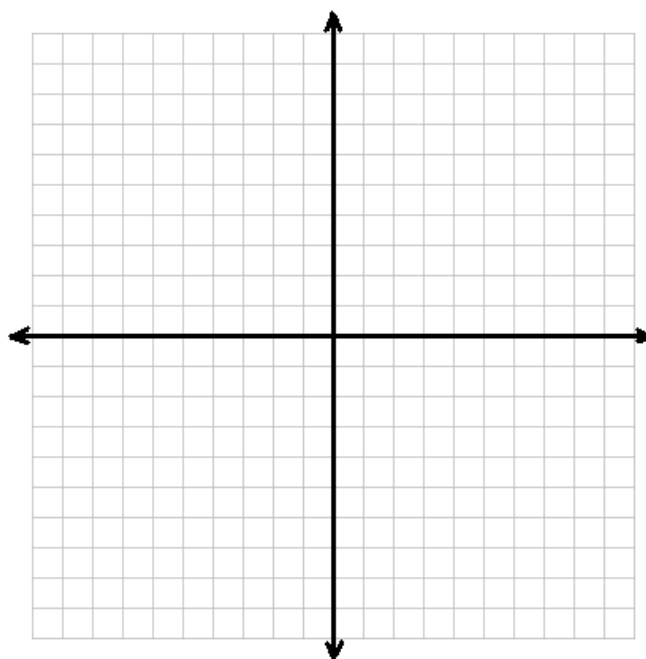
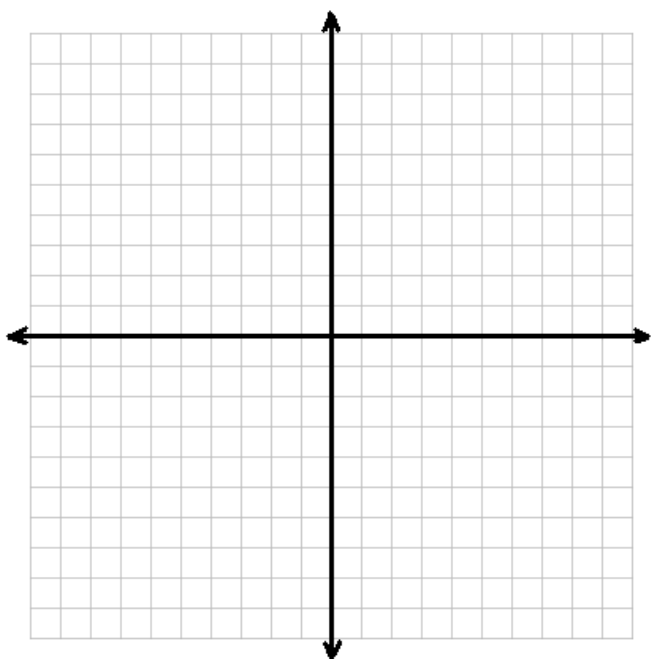


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23) $f(x) = -x^2 + 2x + 8$

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

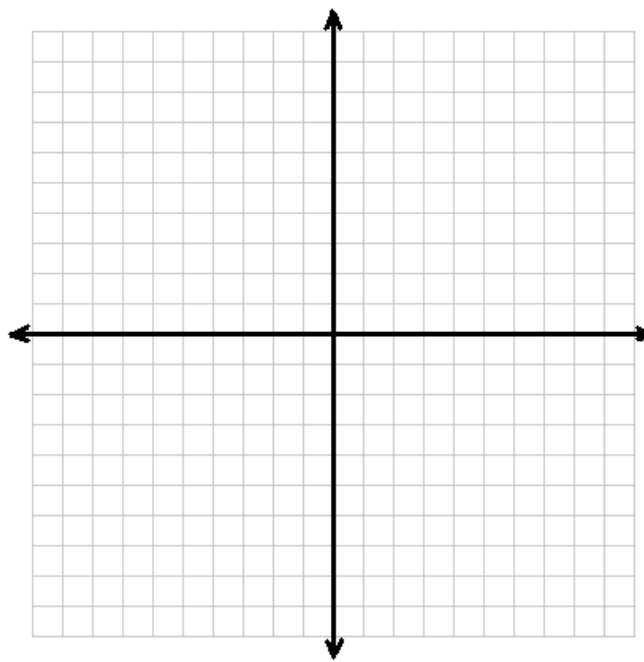
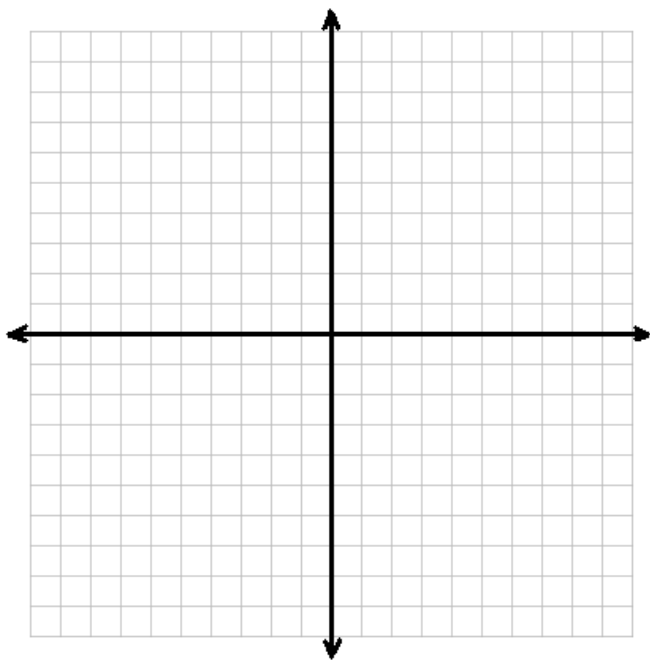


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25) $f(x) = -|3x + 6| + 7$

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



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

28) $f(x) = |2x + 2| - 3$

