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Math 48A, Lesson 3: Graph More Popular Functions

5. GRAPH CUBIC FUNCTION (TYPE OF POWER FUNCTION)

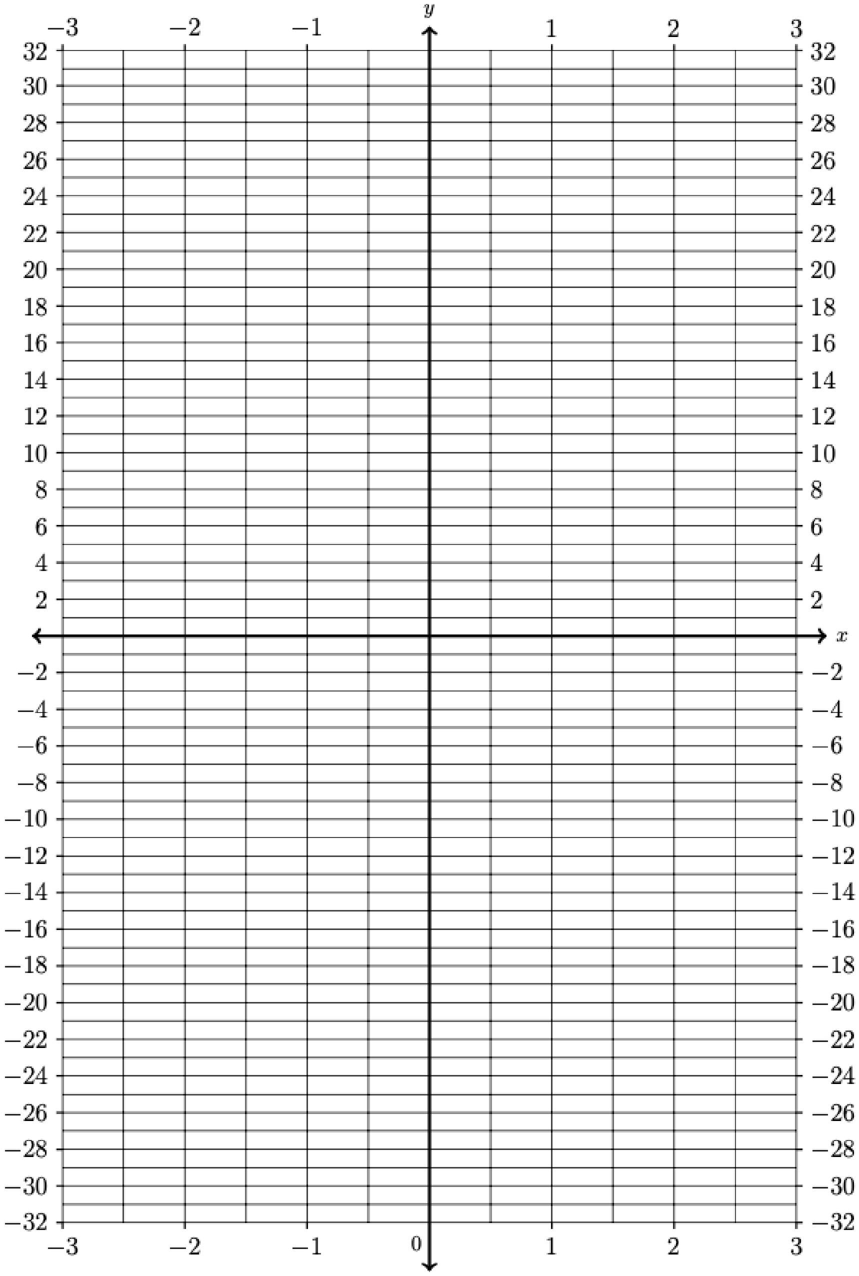
Consider the quadratic function

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

Fill out the table below. Then use that table to graph the quadratic function.

A. Fill in the table below
B. Plot these points on the axis provided
C. Interpolate between the points you plotted to create the graph of this function

Input	*Output values*
x	$f(x) = x^3$
-4	
-3	
-2	
-1	
$-\frac{1}{2}$	
0	
$\frac{1}{2}$	
1	
2	
3	
4	


y
x
−3
−2
−1
0
1
2
3
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
−2
−4
−6
−8
−10
−12
−14
−16
−18
−20
−22
−24
−26
−28
−30
−32

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5D. What is the x–intercept of the cubic function $f(x) = x^3$?

(Write about how the x-intercept shows up in your graph from parts 5A – 5C).

5E. What is the y–intercept of the cubic function $f(x) = x^3$?

(Write about how the y-intercept shows up in your graph from parts 5A – 5C).

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5F. What is the domain of the cubic function $f(x) = x^3$?

(Write about how the domain shows up in your graph from parts 5A – 5C).

5G. What is the range of the cubic function $f(x) = x^3$?

(Write about how the range shows up in your graph from parts 5A – 5C).

5H. What does the graph of the cubic function $f(x) = x^3$ look like?

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6. RATIONAL FUNCTION

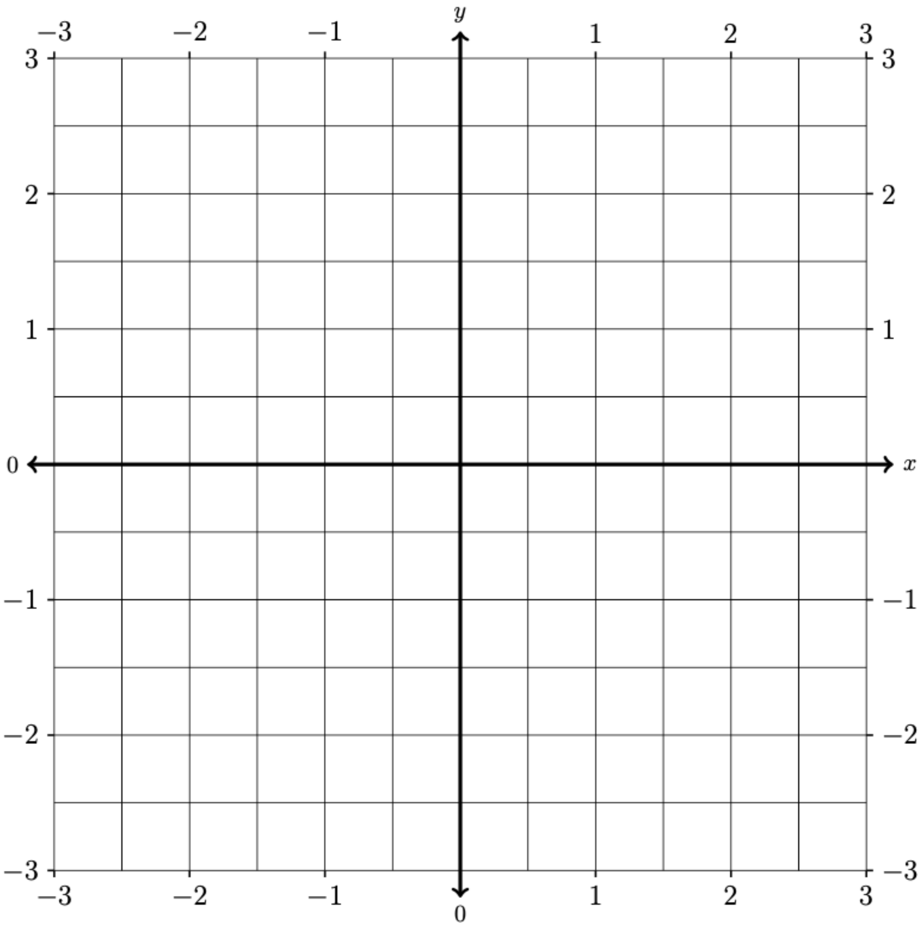
Consider the absolute value function

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

Fill out the table below. Then use that table to graph the absolute value function.

A. Fill in the table below
B. Plot these points on the axis provided
C. Interpolate between the points you plotted to create the graph of this function

Input	*Output*
x	$f(x) = \frac{1}{x}$
-3	.
-2	
-1	
$-\frac{1}{2}$	
$-\frac{1}{3}$	
0	
$\frac{1}{3}$	
$\frac{1}{2}$	
1	
2	
3	



6D. What is the x–intercept of the rational function $f(x) = \frac{1}{x}$?

(Write about how the x-intercept shows up in your graph from parts 6A – 6C).

6E. What is the y–intercept of the rational function $f(x) = \frac{1}{x}$?

(Write about how the y-intercept shows up in your graph from parts 6A – 6C).

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6F. What is the domain of the rational function $f(x) = \frac{1}{x}$?

(Write about how the domain shows up in your graph from parts 6A – 6C).

6G. What is the range of the rational function $f(x) = \frac{1}{x}$?

(Write about how the range shows up in your graph from parts 6A – 6C).

6H. What does the graph of $f(x) = \frac{1}{x}$ look like?

Name:__________________________ Class #:______

7. RATIONAL FUNCTION

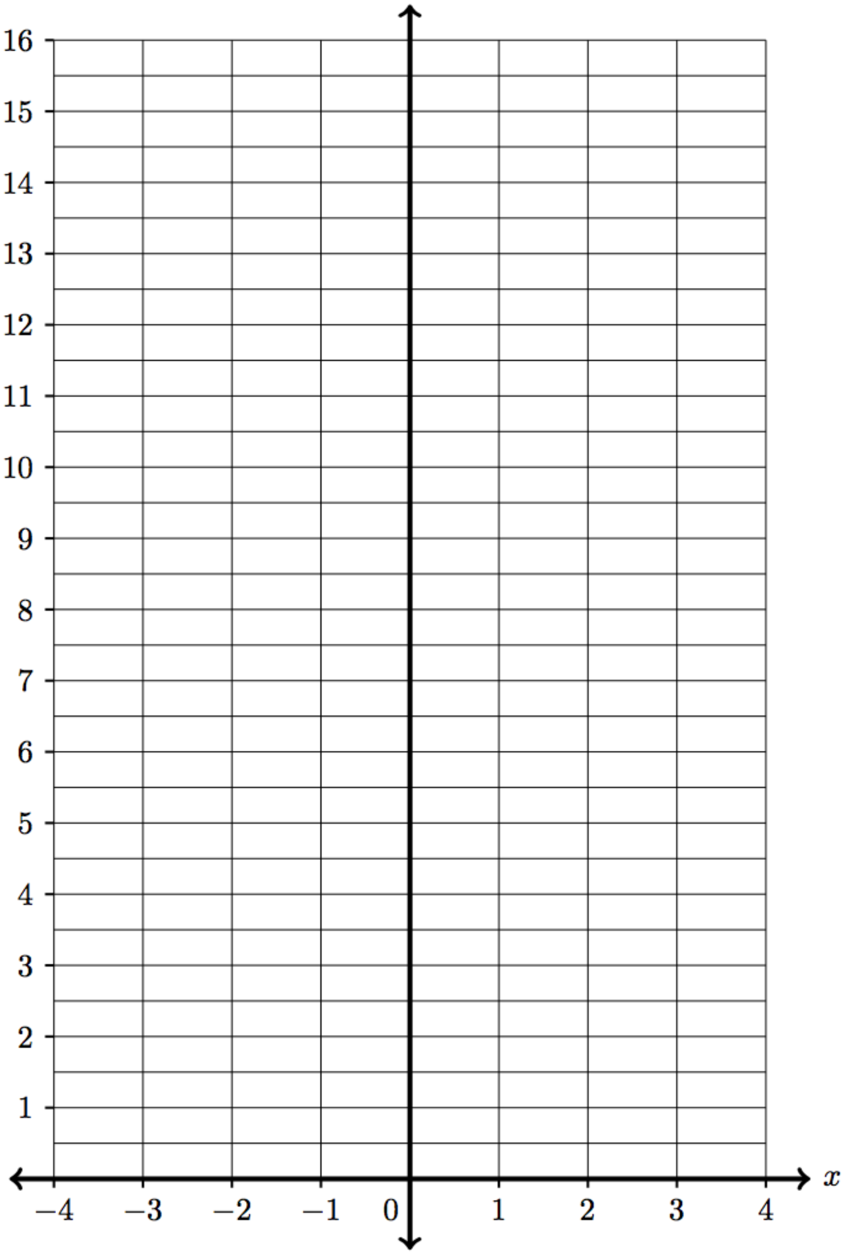
Consider the absolute value function

$$f(x) = \frac{1}{x^2}$$

Fill out the table below. Then use that table to graph the absolute value function.

A. Fill in the table below
B. Plot these points on the axis provided
C. Interpolate between the points you plotted to create the graph of this function

Input	*Output*
x	$f(x) = \frac{1}{x^2}$
-3	
-2	
-1	
$-\frac{1}{2}$	
$-\frac{1}{4}$	
0	
$\frac{1}{3}$	
$\frac{1}{2}$	
1	
2	
3	



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7D. What is the x–intercept of the rational function $f(x) = \frac{1}{x^2}$?

(Write about how the x-intercept shows up in your graph from parts 7A – 7C).

7E. What is the y–intercept of the rational function $f(x) = \frac{1}{x^2}$?

(Write about how the y-intercept shows up in your graph from parts 7A – 7C).

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7F. What is the domain of the rational function $f(x) = \frac{1}{x^2}$?

(Write about how the domain shows up in your graph from parts 7A – 7C).

7G. What is the range of the rational function $f(x) = \frac{1}{x^2}$?

(Write about how the range shows up in your graph from parts 7A – 7C).

7H. What does the graph of $f(x) = \frac{1}{x^2}$ look like?

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8. EXPONENTIAL FUNCTION

Consider the quadratic function

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

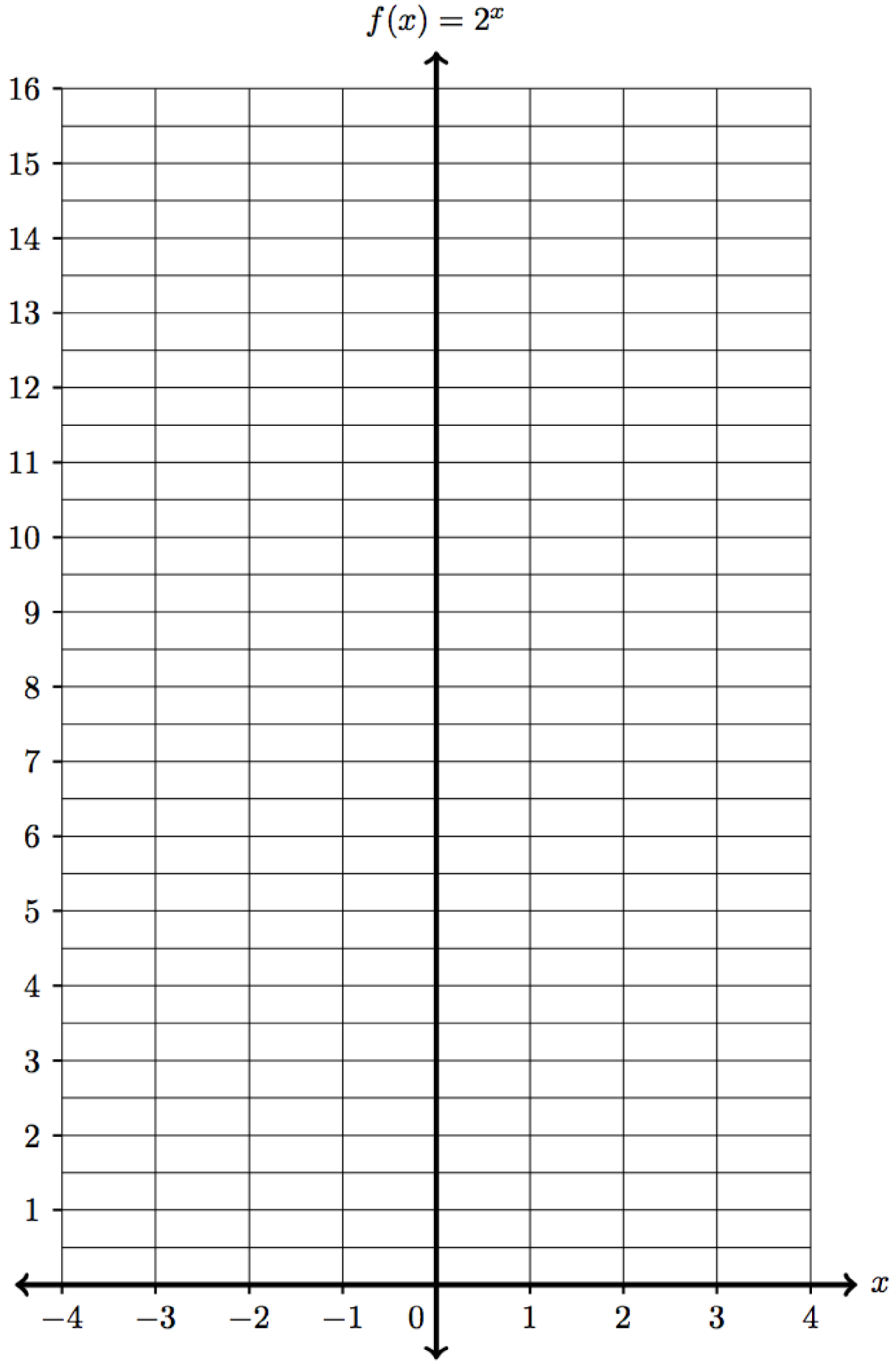
Fill out the table below. Then use that table to graph the quadratic function.

A. Fill in the table below

B. Plot these points on the axis provided

C. Interpolate between the points you plotted to create the graph of this function

x	$f(x) = 2^x$
-4	
-3	
-2	
-1	
0	
1	
2	
3	
4	
5	
6	



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8D. What is the x–intercept of the exponential function $f(x) = 2^x$?
(Write about how the x-intercept shows up in your graph from parts 8A – 8C).

8E. What is the y–intercept of the exponential function $f(x) = 2^x$?
(Write about how the y-intercept shows up in your graph from parts 8A – 8C).

8F. Why does the graph of $f(x) = 2^x$ never go below the x-axis?

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8G. What is the domain of the exponential function $f(x) = 2^x$?

(Write about how the domain shows up in your graph from parts 8A – 8C).

8H. What is the range of the exponential function $f(x) = 2^x$?

(Write about how the range shows up in your graph from parts 8A – 8C).

8H. What does the graph of the exponential function $f(x) = 2^x$ look like?

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9. LOGARITHMIC FUNCTION

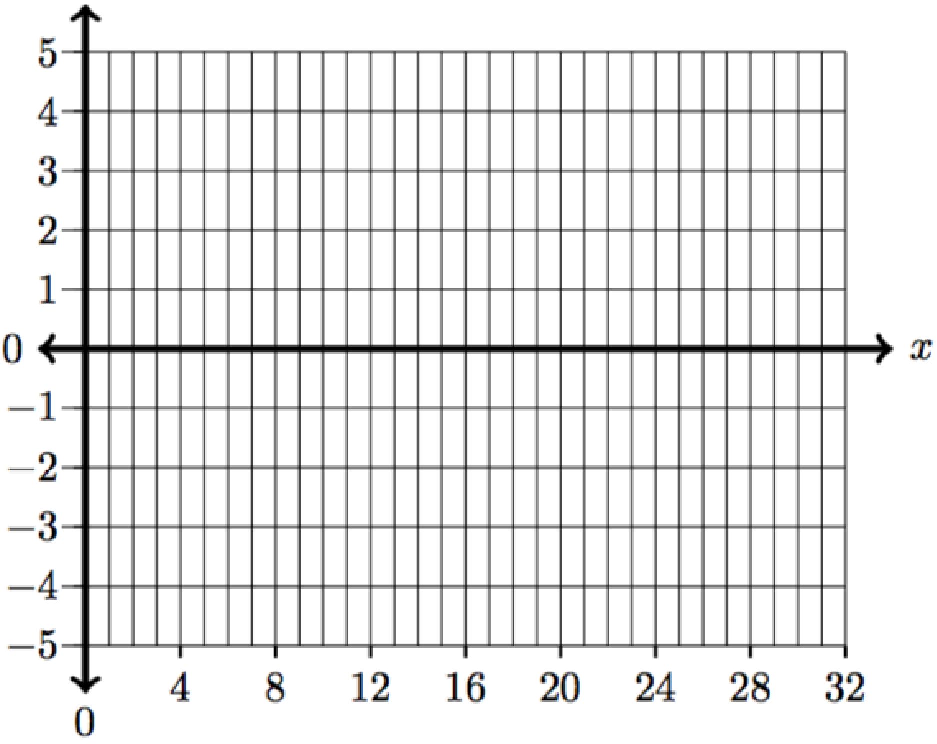
Consider the quadratic function

$$f(x) = \log_2(x)$$

Fill out the table below. Then use that table to graph the quadratic function.

A. Fill in the table below
B. Plot these points on the axis provided
C. Interpolate between the points you plotted to create the graph of this function

x	$f(x) = \log_2(x)$
$\frac{1}{16}$	
$\frac{1}{8}$	
$\frac{1}{4}$	
$\frac{1}{2}$	
1	
2	
4	
8	
16	
32	
64	



9D. What is the x–intercept of the logarithm function $f(x) = \log_2(x)$?
(Write about how the x-intercept shows up in your graph from parts 9A – 9C).

9E. What is the y–intercept of the logarithm function $f(x) = \log_2(x)$?
(Write about how the y-intercept shows up in your graph from parts 9A – 9C).

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9G. What is the domain of the logarithm function $f(x) = \log_2(x)$?

(Write about how the domain shows up in your graph from parts 9A – 9C).

9H. What is the range of the logarithm function $f(x) = \log_2(x)$?

(Write about how the range shows up in your graph from parts 9A – 9C).

9H. What does the graph of the $f(x) = \log_2(x)$ look like?