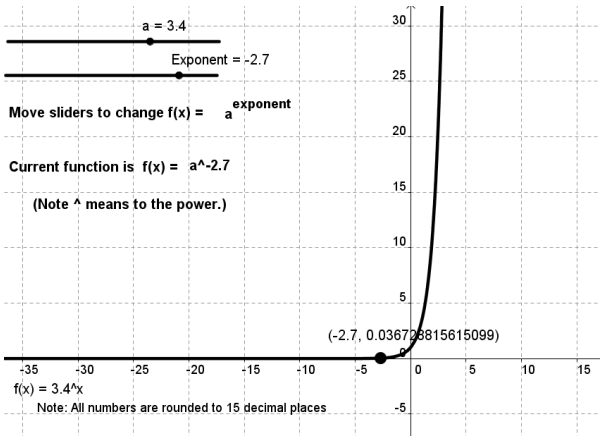
Student Activity: To investigate a^n

Use in connection with the interactive file, 'Exponential', on the student's CD.

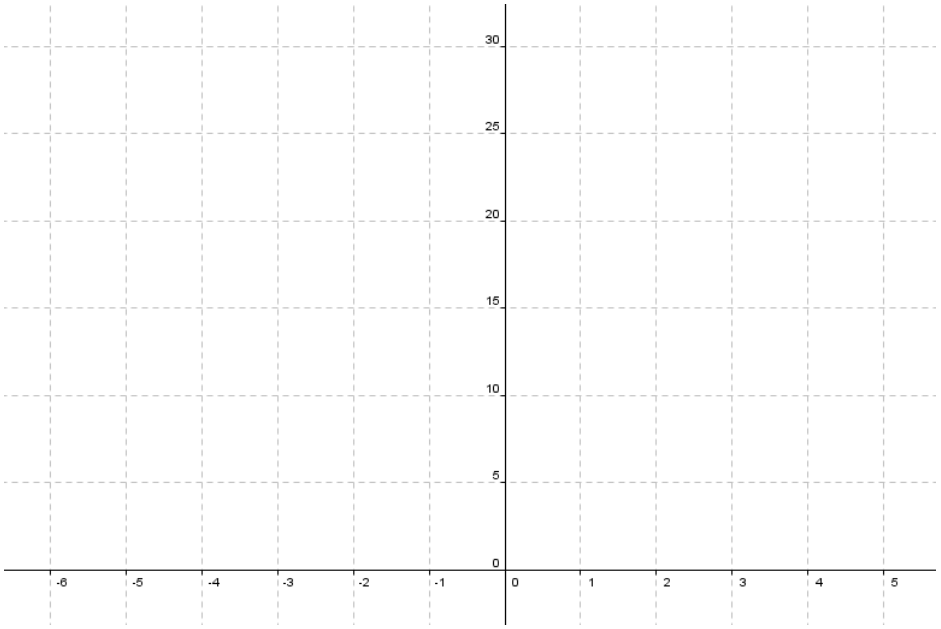


1.

a. Complete the following table:

x	2^x
5	
4	
3	
2	
1	
0	
-1	
-2	
-3	
-4	

b. Draw the graph of the data represented in the table above.



c. This graph is getting closer and closer to the *x*-axis. Will it ever touch it? Explain.

_____

_____

d. Is this an example of a linear, quadratic or exponential function? Explain your reason.

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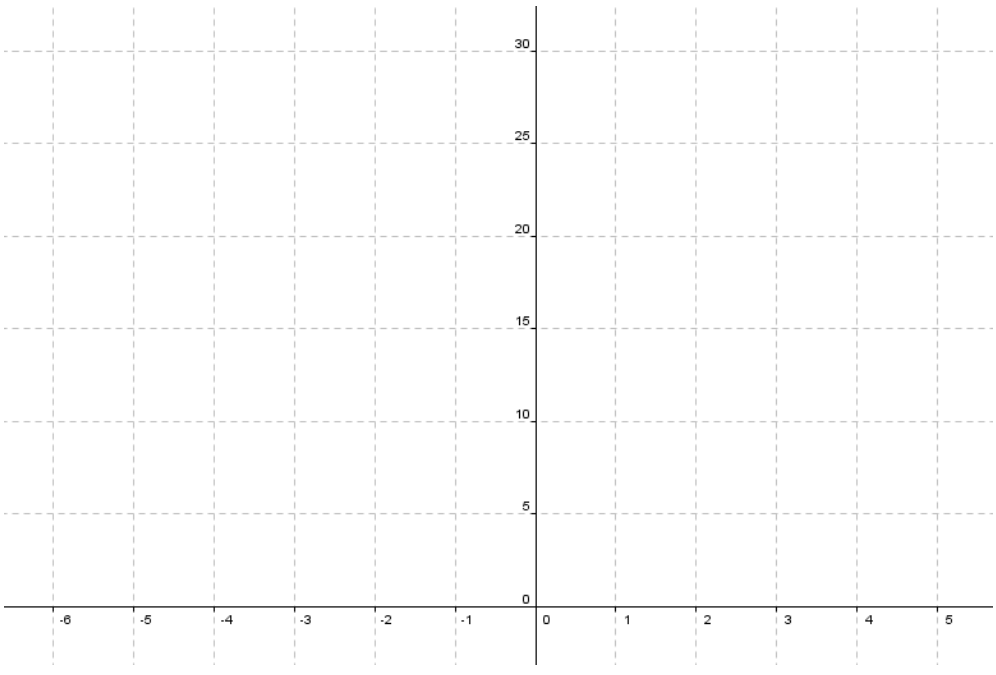
_____

2.

a. Complete the following table:

x	3^x
3	
2	
1	
0	
-1	
-2	
-3	
-4	

b. Draw the graph of the data represented in the table above.



c. What do you notice about the graph for values of x less than one?

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d. This graph is getting closer and closer to the x-axis. Will it ever touch it? Explain.

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_____

e. Is this an example of a linear, quadratic or exponential function? Explain your reason.

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_____

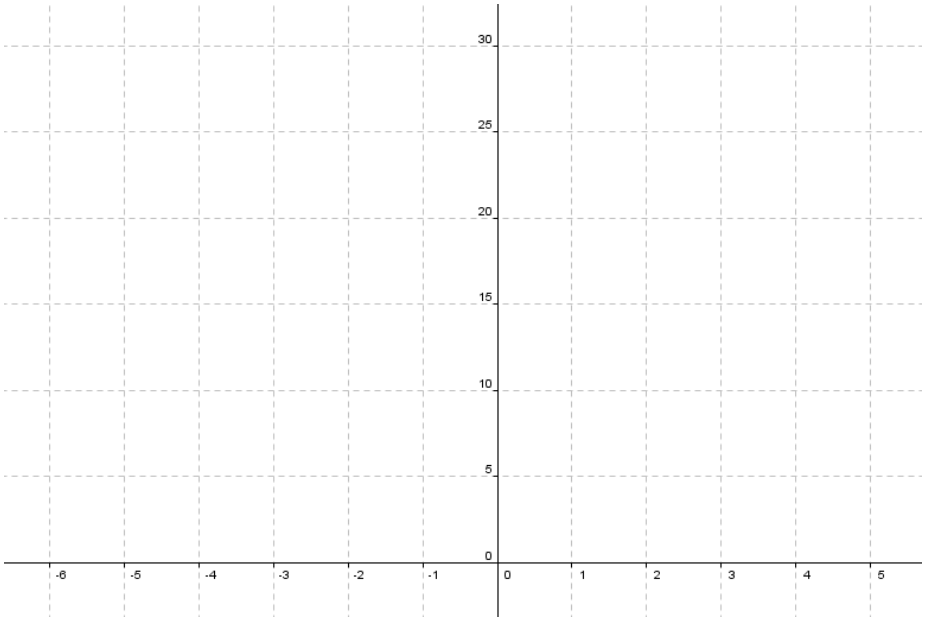
3. What will the shape of the graph a^x be, where $a \in N$ and $x \in R$?

4.

a. Complete the following table:

x	0.5^x
3	
2	
1	
0	
-1	
-2	
-3	
-4	

b. Draw the graph of the data represented in the table above.



c. When *x* is greater than zero what do you notice about the graph?

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d. This graph is getting closer and closer to the x- axis. Will it ever touch it? Explain.

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e. Is this an example of a linear, quadratic or exponential function? Explain your reason.

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_____

5. Using the interactive file describe what happens to the shape of the graph as 'a' varies from 1.1 to 5 while the exponent value remains unchanged. Explain this in terms of the rate of change of f(*x*).

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6. Using the interactive file describe what happens to the shape of the graph when 'a' equals 1? Explain why this happens in terms of the rate of change of f(*x*).

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7. Using the interactive file describe what happens to the shape of the graph as 'a' goes from ·9 to ·1 while the exponent value remains unchanged. Explain this in terms of the rate of change of f(*x*).

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