# Student Activity: To investigate $a^n$
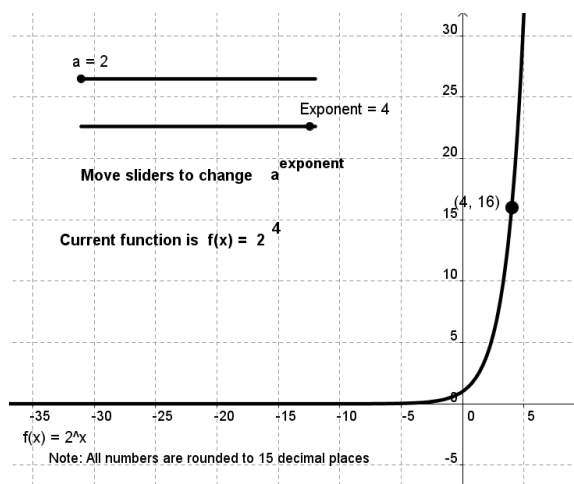
**Use in connection with the interactive file, 'Exponential Function', on the student's CD.**
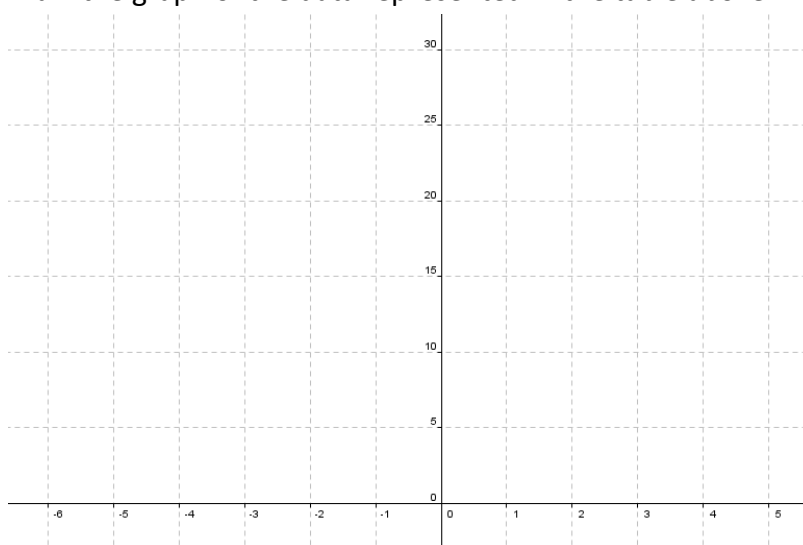
a = 2

Exponent = 4

**Move sliders to change** a **exponent**

**Current function is** $f(x) = 2^4$

(4, 16)

f(x) = 2^x

Note: All numbers are rounded to 15 decimal places

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.
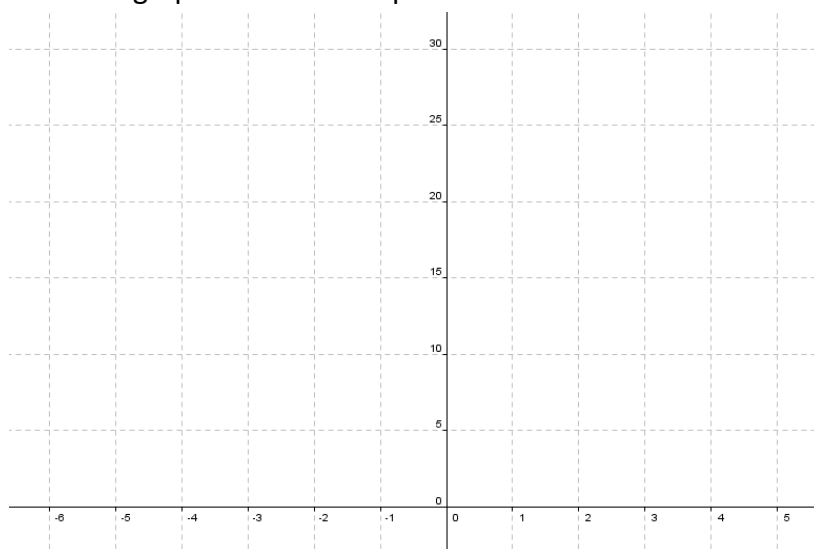
_____

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

_____

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.

_____

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

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