

WARM UP

Write and solve a compound interest formula for the following scenario: You invest \$10,000 on a CD that will yield 5% interest, compounded monthly. What is the value of your investment after 10 years?

$$A = P \left(1 + \frac{r}{n}\right)^{nt}$$

$$A = 10,000 \left(1 + \frac{0.05}{12}\right)^{12t}$$

$$A = 10,000 (1.004167)^{12t}$$

$$A = 10,000 (1.004167)^{120}$$

$$A = 16,470.09$$

ESSENTIAL QUESTION

How do changes in an exponential function relate to the translations of its graph?

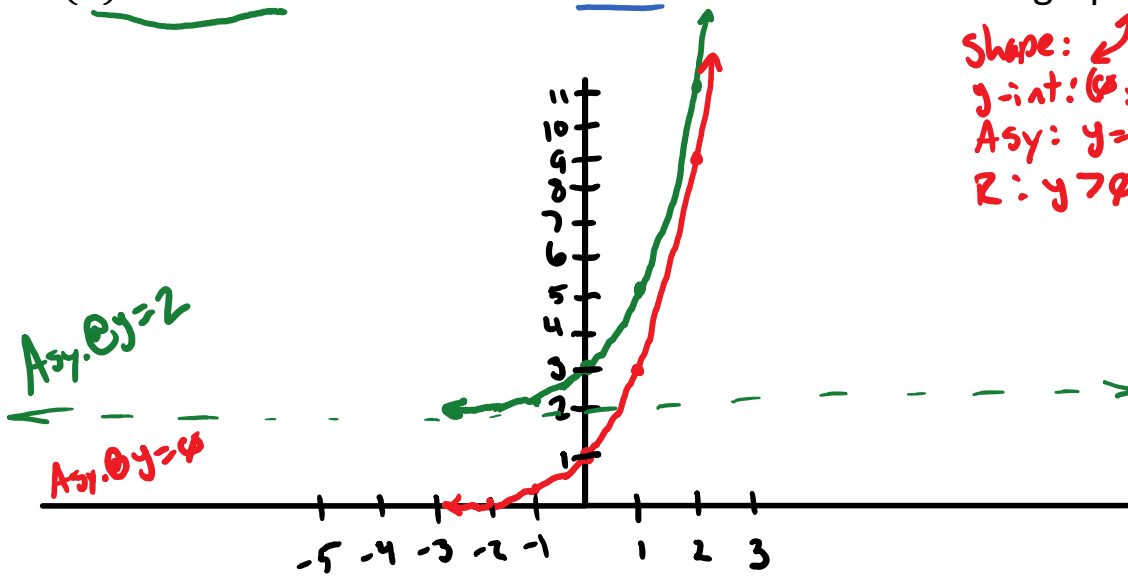
GOAL: "I CAN..."

Perform, analyze, and use transformations of exponential functions."

With your table

Graph the function $g(x) = 3^x$. Then on the same graph, graph the function $t(x) = 3^x + 2$. What is the difference between the two graphs?

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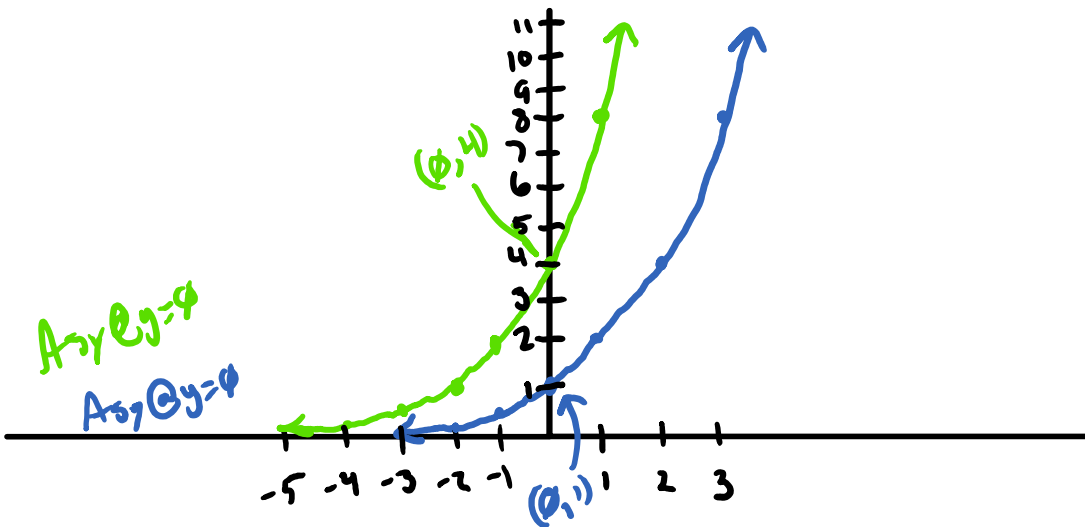


Shape: ↗
 y-int: $(0, 1)$
 Asy: $y=0$
 R: $y > 0$

Shape: ↗
 y-int: $(0, 3)$
 Asy: $y=2$
 R: $y > 2$

y-int: ↗
 Asy: ↗
 R: ↗

Graph the function $g(x) = 2^x$. Then on the same graph, graph the function $t(x) = 2^{x+2}$. What is the difference between the two graphs?



Shape is same. Looks like it is 2 units to ←

$$f(x) = a(b)^{x-h} + k$$

a : will do a dilation, stretch ($a > 1$) or compression ($1 > a > 0$).

b : is your base

h : will shift the graph left(+) or right(-) h units.

k : will shift the graph up(+) or down(-) k units.

How are the following functions changed from their parent functions?

$$g(x) = 2^x + 2$$

↑ 2 units

$$h(x) = 2^x - 4$$

↓ 4 units

$$t(x) = 2^{x-6}$$

↳ 6 units

$$n(x) = 2^{x+4}$$

↳ 4 units

What transformations are taking place in each function?

$$v(x) = 2^{x-3} + 4$$

↳ 3
↑ 4

$$r(x) = 2^{x+9} - 3$$

↳ 9
↓ 3

$$s(x) = 3(2)^{x-2} - 6$$

Dilate by 3
(R) 2
(D) 6

With your table

What are the characteristics of each graph? (Without graphing)

$$t(x) = 2^{x+4} - 9$$

(D) 4 ↓ 9 ← Asy and R
 $2^4 = 16$
 $16 - 9 = 7$ ↙ y-int

Shape: ↖ ↗
 y-int: $(0, 7)$
 Asy.: $y = -9$
 R: $y > -9$

$$h(x) = 2^{x-1} + 3$$

← Asy, R
(D) 1 ↑ 3
 $2^{-1} = \frac{1}{2} + 3 = 3.5$ ↘ y

Shape: ↖ ↗
 y-int: $(0, 3.5)$
 Asy: $y = 3$
 R: $y > 3$

What are the characteristics of each graph? (Without graphing)

$$j(x) = 2^{x-2} + 1$$

(D) 2 ↑ 1
 $2^{-2} = \frac{1}{4} + 1 = 1.25$

Shape: ↖ ↗
 y-int: $(0, 1.25)$
 Asy: $y = 1$
 R: $y > 1$

$$c(x) = 2^{x+3} - 2$$

(D) 3 ↓ 2
 $2^3 = 8 - 2 = 6$

Shape: ↖ ↗
 y-int: $(0, 6)$
 Asy: $y = -2$
 R: $y > -2$

R: $y > 1$

<https://tinyurl.com/shfwaox>



HOMework

Pg. 250

16, 19-24, 30, 34

