

13.1 Notes

Exponential Growth Functions

- 1) Consider the parent function $f(x) = b^x$
★ Different from x^a ★
↑
ratio (multiplier)

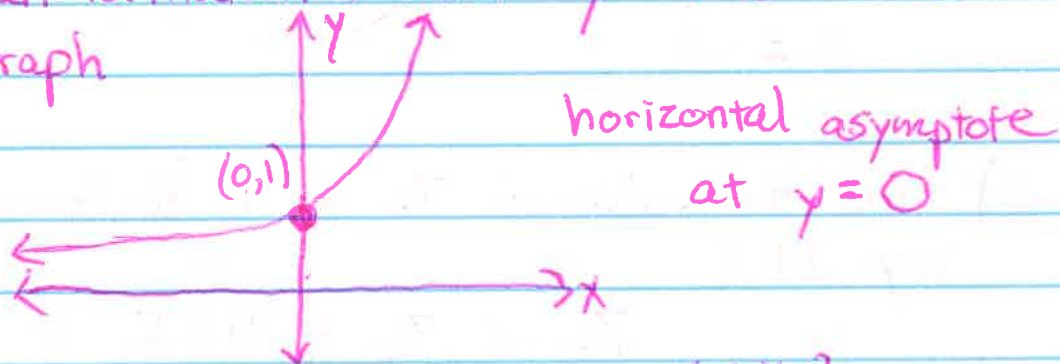
If $b > 1$, exponential growth.

The reference point is $(0, 1)$

Domain $x \in \mathbb{R}$, range is $y > 0$

Transformational form $y = a \cdot b^{x-h} + d$

Graph

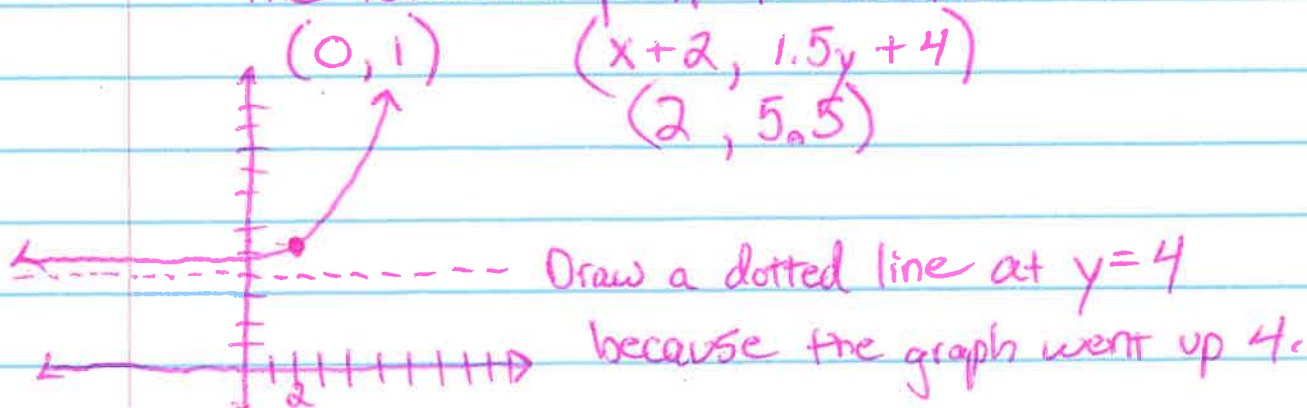


- 2) Given the equation $y = 1.5(2)^{x-2} + 4$

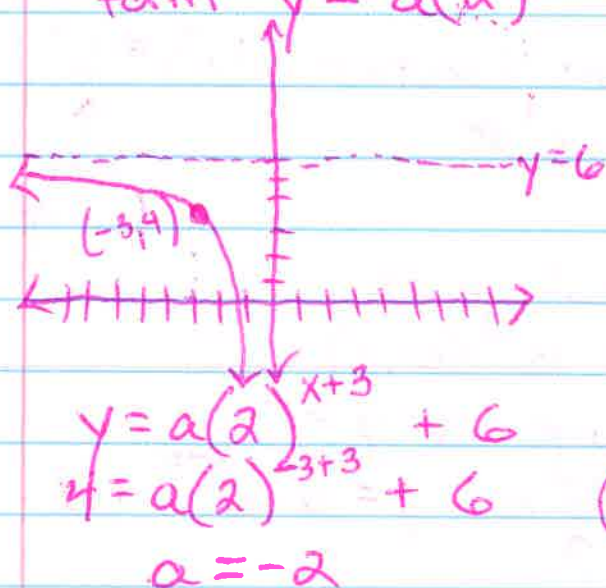
a) Describe the transformations

right 2, up 4, vertical stretch by 1.5

b) Graph the equation and determine where the reference point is located.



3) Given the graph, write an equation of the form $y = a(2)^{x-h} + k$



b) Domain
 $x \in \mathbb{R}$
 Range
 $y < 6$

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

6) Find the value of 76 if it decreases by 24%.

$$76 \cdot 0.76 = 57.76$$

7) Find the value of 19 if it increases by 7.6%

$$19 \cdot 1.076 = 20.444$$

- 4) A house worth \$100,000 appreciates in value by 3% each year. Find the value in 10 years.

$$A = P(1+r)^t$$

$$A = 100,000(1+0.03)^{10}$$

$$A = \$134,391.64$$

- 5) A \$40,000 car depreciates by 18.3% each year. Find the value in 5 years.

$$A = P(1+r)^t$$

$$A = 40,000(1-0.183)^5$$

$$A = \$14,560.30$$

