

Name: **KEY**

Section 5.1 – Exponents – PC 12 Style

1. Simplify the following

$$\frac{16^{(2x-1)}}{4^{(4x-3)}}$$

$$\frac{2^{4(2x-1)}}{2^{2(4x-3)}} \rightarrow \frac{2^{8x-4}}{2^{8x-6}}$$

$$2^{8x-4-(8x-6)} = 2^2 = \boxed{4}$$

2. Solve for the variable

$$\left(\frac{1}{9}\right)^{(2x-1)} = 27^{(2-x)}$$

$$(9^{-1})^{2x-1} = 27^{(2-x)} \rightarrow (3^{-2})^{(2x-1)} = 3^{3(2-x)}$$

$$3^{-4x+2} = 3^{6-3x}$$

$$-4x+2 = 6-3x$$

$$-x = 4 \quad \boxed{x = -4}$$

3. Graph the following exponential. Identify Horizontal Asymptote, Domain, Range, and at least three points.

Horizontal shift +1 vertical shift down 4

$$y = 2^{x-1} - 4$$

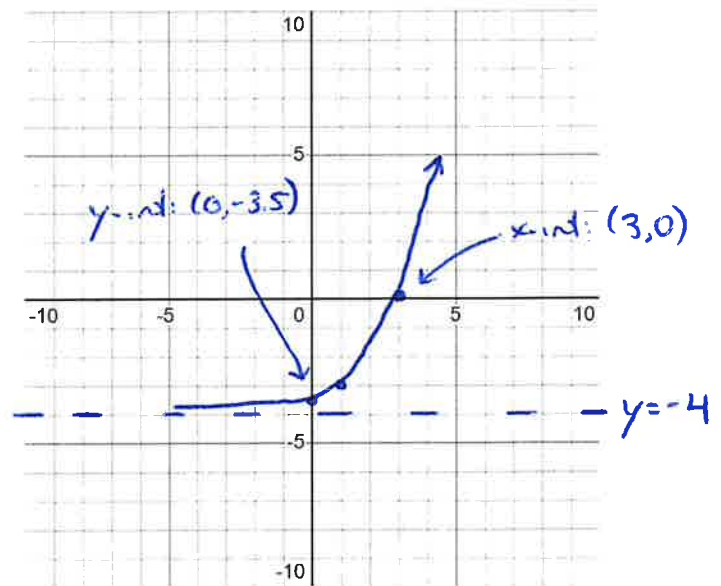
$(0,1) \rightarrow (1,-3)$

Many ways to determine points, but here

$$y\text{-int: } y = 2^{0-1} - 4$$

$$y = 2^{-1} - 4$$

$$y = \frac{1}{2} - 4 \rightarrow -3.5$$



Asymptote shifts down 4
from $y=0$ to $y=-4$

$$x\text{-int: } 0 = 2^{x-1} - 4$$

$$4 = 2^{x-1}$$

D: All Real #'s
R: $y > -4$

$$2^2 = 2^{x-1} \quad x-1 = 2$$

$$x = 3$$