

Name \_\_\_\_\_  
Date \_\_\_\_\_

Advanced Algebra  
Unit 3: Exponential, Log and Power Functions  
Assignment #8

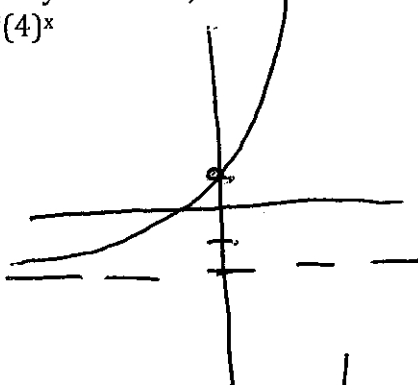
Find the horizontal Asymptote and the x intercept ( if any) and make a sketch of the graph.

Given the form  $y = k+a \cdot b^x$ , **k is the horizontal asymptote**

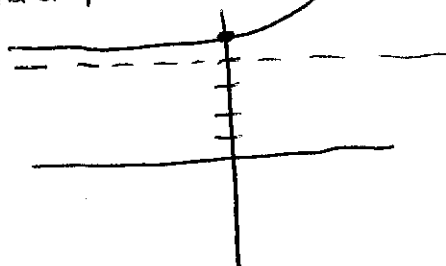
1)  $y = -2+3 \cdot (4)^x$

2)  $y = 4+2^x$

Horizontal Asymptote  $y = -2$   
x int  $-2 + 3 \cdot 4^x = 0$   
 $4^x = \frac{2}{3}$   
 $x = -.209$



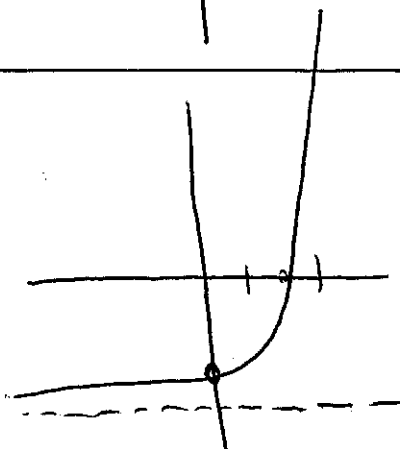
Horizontal Asymptote  $y = 4$   
x intercept: NONE



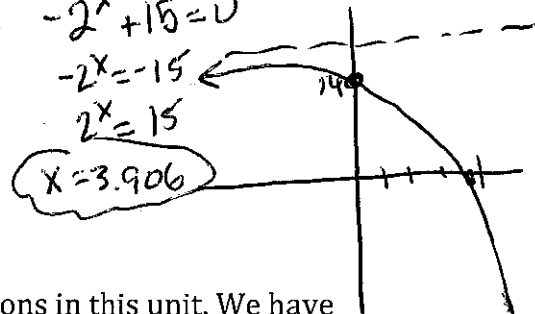
3)  $y = -18 + 6^x$

4)  $y = 15 - 2^x$

Horizontal Asymptote  $y = -18$   
x int  $6^x - 18 = 0$   
 $x = \frac{\log 18}{\log 6}$   
 $x = 1.613$



Horizontal Asymptote  $y = 15$   
x int  $-2^x + 15 = 0$   
 $-2^x = -15$   
 $2^x = 15$   
 $x = 3.906$



We have been working on solving different types of functions in this unit. We have techniques for exponential functions and power functions. Solve the following equations using those techniques that we have been working on.

5)  $4^{2x} = 16 \cdot x^{-5}$

6)  $3+18^x = 205$

Use change of base technique...show work

$4^{2x} = (4^2)^{x-5}$   
 $4^{2x} = 4^{2x-10}$   
 $2x = 2x - 10$

NO Solution

Isolate base and use Log

$18^x = 202$   
 $x = \frac{\log 202}{\log 18}$   
 $x = 1.836$

# Assignment # 8

$$7) 18x^5 + 326 = 1986$$
$$-326 \quad -326$$

This is a power function.  
Reciprocal is last step

$$x^5 = 92$$
$$x = 2.47$$

$$8) 7^{3x-2} = 105^{2x}$$

Use log 7 to both  
sides...show work

$$(3x-2) = 2x \left( \frac{\log 105}{\log 7} \right)$$

$$2.4(2x)$$

$$3x-2 = 4.8x$$

$$-2 = 1.8x$$

$$x = -1.11$$

$$9) \frac{3+2^x}{15} = 200$$

Isolate base and  
use Log

$$2^x = 2997$$

$$x = 11.55$$

$$10) \frac{18x^4}{19} = 325$$

This is a power function.  
Reciprocal is last step

$$x^4 = 343$$

$$x = (343)^{\frac{1}{4}}$$

$$x = 4.3$$

$$11) 28 + 3 \cdot 4^x = 1967$$

$$4^x = 646.3$$

$$x = 4.66$$

Isolate base and  
use Log

$$12) 8^{6x-2} = 25^{2x}$$

Use log 8 to both  
sides...show work

$$6x-2 = 2x \log_8 25$$

$$6x-2 = 3.0959x$$

$$2.9041x = 2$$

$$x = .68868$$