U4D5 MCR3UI

Graphing Exponential Functions and Determining Exponential Equations of the form y=a(b)^x

Warm Up:

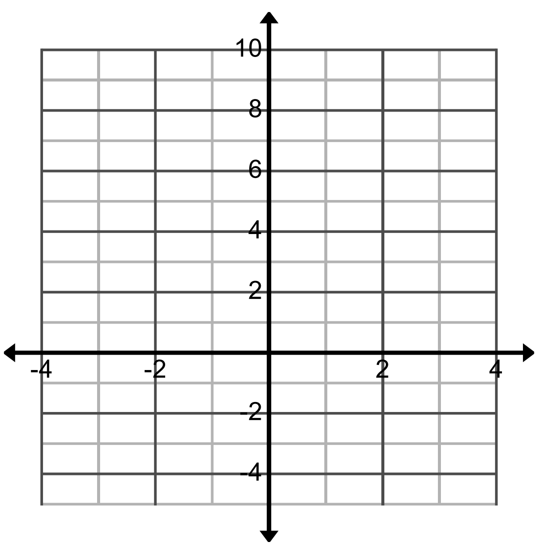
Simplify.

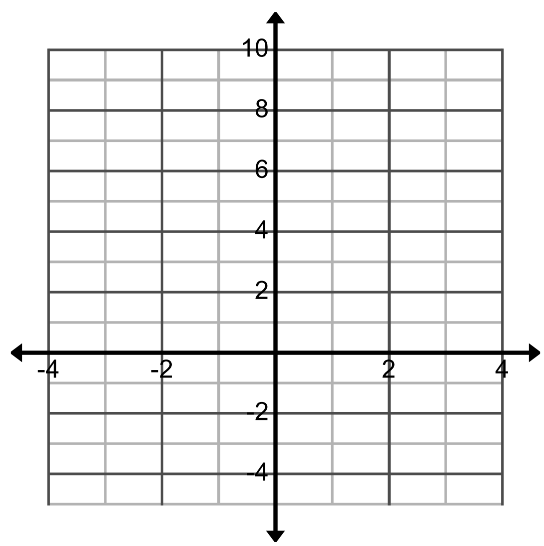
a) $\left(\frac{2x^2}{yz^3}\right)^2\left(\frac{y^2z^3}{2x^4}\right)^3$ b) $81^{-\frac{1}{2}} \div 27^{-\frac{2}{3}}$ c) $\frac{(y^{x-1})(y^{2x+5})}{y^{3x-1}}$

d) $y=\frac{1}{8}(2)^{n-1}$ e) $y=12(3)^{n+2}$ f) $y=\frac{(2)^{n-1}(4)^n}{(8)^{n-4}}$

Graphing Base Exponential Functions

$f(x)=2^x$ $g(x)=\left(\frac{1}{3}\right)^x$



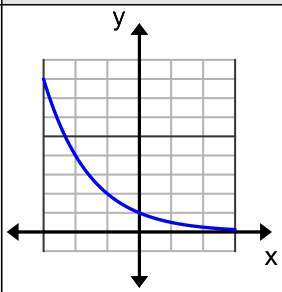
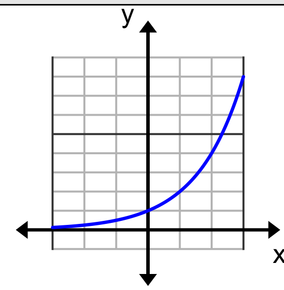
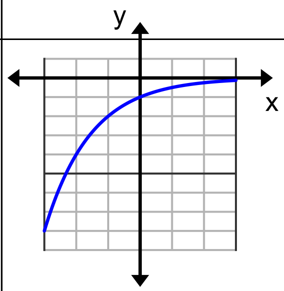
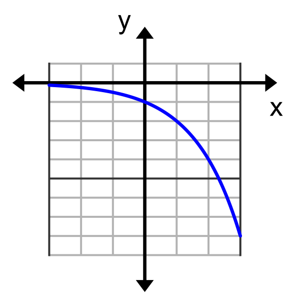


Determining the Equation of an Exponential Function

1. Complete the chart to compare the effect of changing the value of a in y=a(2^x).

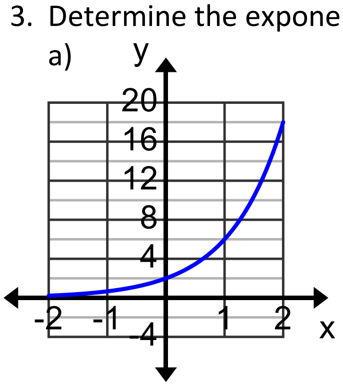
	f(x)=2^x	y=3(2)^x	y=0.5(2)^x	y=-(2)^x	y=-3(2)^x
Domain					
Range					
y-intercept					
asymptote					
Inc./dec.					

2. Summary: Exponential Equations of the form $y=a(b)^x$

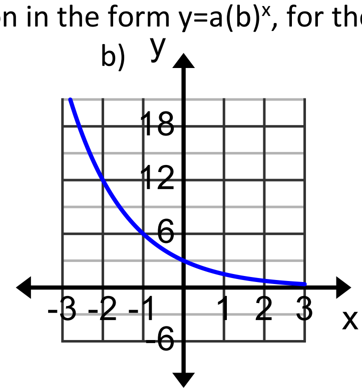
	0 < b < 1	b > 1
a > 0 (i.e. a is positive)	 _______________ on xϵR D={ } R={ } Horizontal Asymptote: ________ y-intercept: y=___	 _______________ on xϵR D={ } R={ } Horizontal Asymptote: _______ y-intercept: y= ____
a < 0 (i.e. a is negative)	 _____________ on xϵR D={ } R={ } Horizontal Asymptote: ___________ y-intercept: y= ____	 _______________ on xϵR D={ } R={ } Horizontal Asymptote: ____________ y-intercept: y= ____

3. Determine the exponential equation in the form $y=a(b)^x$, for the given graphs.

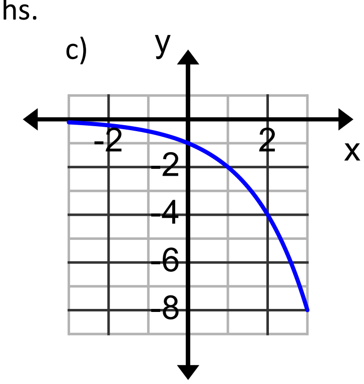
a)



b)



c)



4. Write an Exponential Function given the properties within each situation below (solution on back):

i) A bacteria colony doubles every hour. The initial population contained 5 bacteria. Write a function to relate the population of bacteria to the time, in hours.

ii) A radioactive sample has a half-life of 3 days. The initial sample is 200 mg. Write a function to relate the amount remaining, in milligrams, to the time, in days. Then, determine the range for the radioactive sample.