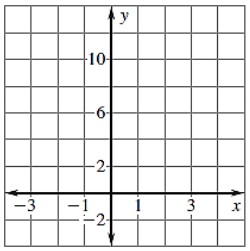
Honors Precalculus

Name:_____ Per: _____

Chapter 3 PRACTICE TEST *Use a separate piece of paper to show your work, if necessary.*

1. Complete the table, graph and state the domain and range for: $f(x) = 0.8e^x - 2$

x	-3	-2	-1	0	1	2	3
f(x)							



Domain:

Range:

2. If $f(x) = 2^x$ describe how the following compare:

a) $g(x) = 4(2)^{x+8} - 3$

b) $h(x) = -(2)^{-x}$

3. A couple bought a house in 2008 when the value of the house was $240,000. The house appreciates at a rate of 5% annually.

a) Write an equation for the value of the house *t* years after 2008.

b) Find the value of the house in 2020.

4. Find the value of an investment of $25,000 for 5 years at an interest rate of 4% if the money is compounded:

a) semi-annually

b) continuously

5. Evaluate each and justify by writing in exponential form.

$ln(\sqrt{e}) =$ _____ since

$log(10) =$ _____ since

$log\left(\frac{1}{10}\right) =$ _____ since

$log_{25}(5) =$ _____ since

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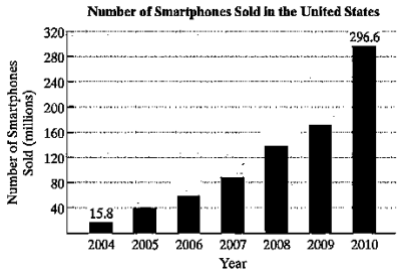
6. State where the vertical asymptote for each occurs.

a) $f(x) = \log(x)$

b) $g(x) = \log(x - 3) + 4$

c) $h(x) = \ln(x)$

7. a) Use the graph to find the equation ($A = A_0e^{kt}$) for the number of smart phones *t* years after 2000 if you use the values for 2004 and 2010 given.



b) Use your equation to determine the number of smartphones in 2017.

8. True or false? If false, correct the mistake.

a) $\log(xy^2) = 2\log(xy)$

b) $\ln\left(\frac{x}{y}\right) = \ln(x) - \ln(y)$

9. Solve for x.

a) $\ln(x-4) - 5 = 2$

b) $125^x + 75 = 100$

10. How long, to the nearest tenth of a year, will it take an investment to triple in value at 4.5% interest compounded continuously?

11. The pH of a solution is given by $pH = -\log(x)$ where x is the concentration of hydrogen ions in moles/liter.

What is the hydrogen ion concentration of stomach acid if it has a pH of 2.2?

12. The half-life of Uranium 238, a key component of nuclear material, is 4.5 billion years.

Using the model $A = A_0 e^{kt}$ and the given half-life

a) what is the continuous decay rate (k)?

b) How long does it take for just 10% to decay?

13. The logistic growth function

$$f(t) = \frac{90}{1 + 271e^{-0.122t}}$$

describes the percentage of Americans who are *t* years old and have some coronary heart disease.

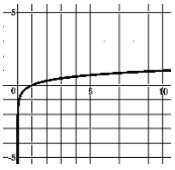
a) What percent of newborns have some coronary heart disease?

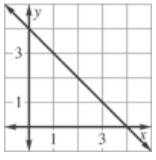
b) What about 50-year olds?

c) What is the limiting percentage?

14. **Match the equation with its graph.**

_____ $y = -x + 4$ _____ $y = 4(0.2)^x$ _____ $y = \log(x)$

A. 

B. 

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