Precalculus
3.1-3.3 Review

Name:

1. Given $f(x) = 4^x$, evaluate:

a. $f(-3)$ $\frac{1}{64}$

b. $f\left(\frac{1}{2}\right)$ 2

c. $f\left(-\frac{3}{2}\right)$ $\frac{1}{8}$

2. Write the equation of a logistic function that has a limit to growth of 84, an initial value of 4 and goes through the point (5, 21).

$y = \frac{84}{1+20 \cdot .68^x}$

3. The half-life of a substance is 4 minutes. The original mass is 100 grams. How much of the substance remains after 15 minutes?

$y = 100 \cdot \left(\frac{1}{2}\right)^{t/4}$

$100 \cdot \left(\frac{1}{2}\right)^{15/4}$

≈ 7.43 grams

4. Write the equation of a logistic function that has a limit to growth of 84, an initial value of 4 and goes through the point (5, 21).

$y = \frac{84}{1+20 \cdot .68^x}$

oops

5. Write the equation of an exponential function that goes through (0,2) and (3,12). (Round b-value to nearest hundredths.)

$y = 2 \cdot b^x$

$12 = 2 \cdot b^3$

$y = 2 \cdot 1.82^x$

6. Evaluate:

a. $\log_2 16$ 4

b. $\log 0.01$ -2

c. $\ln e$ 1

d. $\ln 1$ 0

7. Use the function $f(x)=\frac{10}{1+2e^{-0.1x}}$ to identify the following properties of its graph:

a. Y-intercept: $(0, \frac{10}{3})$

b. Asymptotes: $10, 0$

c. Y-coordinate of symmetry: 5

8. You deposit $500 in an account that pays 8% annual interest compounded yearly.

a. Write an equation representing the total amount of money in your account in years.

$y = 500(1.08)^t$

b. What is the account balance after 6 years?

$\approx \$793.44$

c. How much would the $500 be worth after 35 years?

$\approx \$7392.67$

9. Evaluate the following without a calculator:

a. $\log_{\frac{1}{2}} 8$

$\frac{1}{2}^x = 8$

$2^{-x} = 2^3$

-3

b. $\log \frac{1}{\sqrt{1000}}$

$10^x = 10^{3/2}$

$x = 3/2$

c. $\ln \sqrt[3]{e^4}$

$4/3$

10. Evaluate the following with a calculator:

a. log217

2.34

b. log(-15)

$\emptyset$

c. ln(0.345)

-1.06

11. Describe how to transform the graph $f(x)=\ln x$ into the graph $g(x)=-\frac{1}{2}\ln(4x-1)+3$.

Vertical
- Reflect over x-axis
- shrink BAFO $\frac{1}{2}$
- up 3

Horizontal
- Right 1
- shrink BAFO $\frac{1}{4}$