

Sample Questions to the Final Exam in Math 1111—Chapter 4

Section 4.1

1. \$1500 is invested at an annual rate of 8% compounded quarterly. What is the balance after 5 years?

$$B = p \left(1 + \frac{r}{n} \right)^{nt}$$

a. \$1624.67 b. \$2237.74 c. \$2228.92 d. \$2226.04 e. None of these

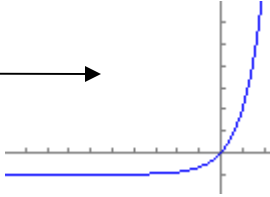
2. Determine the amount of money that should be invested at an annual rate of 8% compounded quarterly

to produce a final balance of \$20,000 in 10 years. $B = p \left(1 + \frac{r}{n} \right)^{nt}$

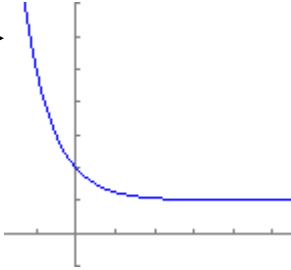
a. \$16,406.97 b. \$9057.81 c. \$18,463.80 d. \$9081.26 e. None of these

3. \$3500 is invested at a rate of $4\frac{1}{2}\%$ compounded continuously. What is the balance at the end of 10 years? $B = Pe^{rt}$

a. \$315,059.96 b. \$5472.45 c. \$5221.39 d. \$5489.09 e. None of these

4. Match the graph with the correct function. 

a. $y = 3^{x-1}$ b. $y = 3^x - 1$ c. $y = 3^{1-x}$ d. $y = 3^{-x} - 1$ e. None of these

5. Match the graph with the correct function. 

a. $4^x + 1$ b. $4^x + 2$ c. $4^{-x} + 1$ d. $4^{-x} + 2$ e. None of these

Section 4.2

1. Evaluate: $\log_a \left(\frac{1}{a} \right)$.

a. 1 b. -1 c. a d. $\frac{1}{a}$ e. None of these

2. Write in logarithmic form: $4^3 = 64$.

a. $4 \log 3 = 64$ b. $\log_4 64 = 3$ c. $\log_3 4 = 64$ d. $\log_3 64 = 4$ e. None of these

3. Write in exponential form: $\log_b 7 = 13$.

a. $7^{13} = b$ b. $b^{13} = 7$ c. $b^7 = 13$ d. $7^b = 13$ e. None of these

4. Find the domain of the function: $f(x) = 3 \log(5x - 2)$.

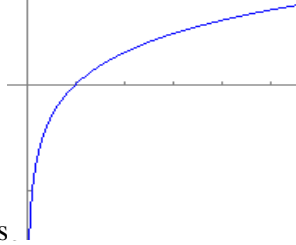
a. $(-\infty, \infty)$ b. $(0, \infty)$ c. $\left(\frac{2}{5}, \infty \right)$ d. $(.064, \infty)$ e. None of these

5. What is the vertical asymptote for $f(x) = \log_2 x$?

a. $x=2$ b. $x=0$ c. $y=0$ d. $y=2$ e. None of these

6. What is the horizontal asymptote for $f(x) = 2^x$?

a. $x=2$ b. $x=0$ c. $y=0$ d. $y=2$ e. None of these

7. Match the graph with the correct function. 

a. $f(x) = 3^x$ b. $f(x) = \log_3 x$ c. $f(x) = 3^{-x}$ d. $f(x) = 3 \log x$ e. None of these

8. What is $f^{-1}(x)$, if $f(x) = 4^x$?

a. $f^{-1}(x) = \frac{1}{4^x}$ b. $f^{-1}(x) = \log_4 x$ c. $f^{-1}(x) = 4^{-x}$ d. $f^{-1}(x) = \log_x 4$ e. None of these

9. Simplify: $\log_2 \left(\frac{1}{16} \right)$.

a. 4 b. -4 c. 8 d. $\frac{1}{2}$ e. None of these

Section 4.3

- Identify the expression that is equivalent to $\log_2 7$.
 a. $\frac{\log 2}{\log 7}$ b. $\frac{\ln 2}{\ln 7}$ c. $\frac{\ln 7}{\ln 2}$ d. $\log 7 - \log 2$ e. None of these
- Evaluate $\log_4 7$ to 4 decimal places.
 a. .2430 b. .5596 c. .7124 d. 1.4037 e. None of these
- Which of the choices below is equivalent to $\log_b \left(\frac{x^3 y^2}{\sqrt{w}} \right)$?
 a. $x^3 + y^3 - \sqrt{w}$ b. $\frac{1}{3} \log_b x + \frac{1}{2} \log_b y - 2 \log_b w$ c. $3 \log_b x + 2 \log_b y - \frac{1}{2} \log_b w$ d. $\frac{3 \log_b x + 2 \log_b y}{\frac{1}{2} \log_b w}$ e. None of these
- Write as a logarithm of a single quantity: $\frac{1}{4} \log_b 16 - 2 \log_b 5 + \log_b 7$.
 a. $\frac{14}{25}$ b. $\log_b \frac{2}{175}$ c. 1 d. $\log_b \frac{14}{25}$ e. None of these
- Evaluate $\log_a 24$, given that $\log_a 2 = 0.4307$ and $\log_a 3 = 0.6826$.
 a. 0.8820 b. 1.9747 c. 0.2940 d. 1.1133 e. None of these
- Simplify: $\ln \sqrt[4]{e^3 x}$.
 a. $\frac{3}{4} + \frac{1}{4} \ln x$ b. $\frac{3}{4} + \ln \frac{x}{4}$ c. $\frac{3e}{4} + \frac{1}{4} \ln x$ d. $\frac{3e}{4} + \frac{1}{4} \ln \frac{x}{4}$ e. None of these

Section 4.4

- Solve for x: $3^{2x} = 81$.
 a. 13.5 b. $\frac{1}{4}$ c. 4 d. 2 e. None of these
- Solve for x: $\ln e^{2x+1} = 9$.
 a. $\frac{-1 + \ln 9}{2}$ b. $\frac{9}{2 \ln e} - \frac{1}{2}$ c. 23 d. 4 e. None of these
- Solve for t: $e^{-.0097t} = 12$.
 a. -256.1759 b. -1237.1134 c. 16,778,844.47 d. -2.5886 e. None of these
- Solve for x: $\ln(7-x) + \ln(3x+5) = \ln(24x)$.
 a. $\frac{6}{11}$ b. $\frac{7}{3}$ c. $\frac{7}{3}, -5$ d. $\frac{6}{11}, 5$ e. None of these
- Solve for x: $\log(7-x) - \log(3x+2) = 1$.
 a. $\frac{19}{31}$ b. $-\frac{13}{31}$ c. $-\frac{27}{29}$ d. $\frac{9}{4}$ e. None of these
- Solve for x: $\log_4 x = -1$.
 a. $x = -4$ b. $x = -1$ c. $x = -\frac{1}{4}$ d. $x = \frac{1}{4}$ e. None of these

Section 4.5

- Determine the principal that must be invested at an annual rate of 8% compounded quarterly so that the balance in 40 years will be \$200,000. $B = P \left(1 + \frac{r}{n} \right)^{nt}$
 a. \$90,578.10 b. \$47,539.00 c. \$12,416.00 d. \$8414.00 e. None of these
- An initial deposit of \$3000 is made in a savings account for which the interest is compounded continuously. The balance will double in 7 years. What is the annual rate of interest for this account?
 $B = Pe^{rt}$
 a. 4.3% b. 6.2% c. 8.1% d. 9.9% e. None of these
- Find the number of years required for a \$2000 investment to triple at an 8% interest rate compounded continuously. $B = Pe^{rt}$
 a. 12.6 b. 13.7 c. 11.2 d. 15.1 e. None of these