

Instructions

- Complete the problems as if this were an actual test.
 - 50-60 minutes of uninterrupted time. (this means no phones, Netflix, snapchat, etc....I promise you will survive 😊)
 - No help from notes, friends, google, etc.
- After you have completed the problems, grade your test using the key provided.
- Try extra problems similar to the ones you missed until you feel like you understand those concepts.

Secondary Math III
Unit 10 Practice Test

Name _____

Period _____

1. Expand the logarithmic expression: $\log_6 \frac{\sqrt{x}}{36}$

2. Solve the equation: $e^{x^2+7} = e^{-6x+2}$

3. Simplify the expression: $\log_{10} 5^x$

4. Use a calculator to evaluate the expression: $\log_{0.5} 14$

5. Solve the equation: $\log 2 + \log x = 1$

6. Condense the logarithmic expression: $\frac{1}{2} \ln(x - 3) - 2 \ln x$

Given $\log_a 2 \approx 0.356$, $\log_a 3 \approx 0.565$, **and** $\log_a 5 \approx 0.827$, **use the properties of logarithms to evaluate the following. Round approximate answers to 3 decimal places.**

7. $\log_a \frac{4}{3}$

8. $\log_a 27$

9. Use the properties of logarithms to expand the expression:

$$\ln\left(\frac{a^3\sqrt{c}}{b^5}\right)$$

10. Use the properties of logarithms to condense the expression (write as a single logarithm):

$$3\log_4x + 3\log_4y - 3\log_4z$$

Solve the following equations. Check for extraneous solutions where needed. Round approximate answers to 3 decimal places.

11. $5^{x-3} = 25$

12. $\log_3(x - 6) + \log_3 x = 3$

13. $\log(x+3) = x^2 - 4$

14. $5 - 3\ln x = 16$

(Solve Graphically on #13 only)

15. $8e^{x+2} = 32$

16. $\log_2 26 = \log_2(4x + 2)$.

Use the following formulas for questions 17 and 18:

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

$$A = Pe^{rt}$$

17. How much money is in an account after 10 years, if \$10,000 is invested now at 4% interest compounded quarterly?

18. How much should you invest in an account giving 4% interest compounded continuously if you want to have \$5,500 in seven years?

19. The radioactive isotope Actinium-227 has a half-life of 26 years.

a. Use the half-life to find k . (Hint: Use the model $y = Ce^{kt}$.) Round to three decimal places.

b. A sample contains 2.1 grams of Actinium-227. How much Actinium-227 will remain in the sample in 77 years? Round answer to one decimal place.

20. Given that $pH = -\log x$, where x is the concentration of hydrogen ion, find the hydrogen ion concentration of a Seawater, with a pH of 8.6.