

Unit 2 Test REVIEW

Show all of your work on a separate sheet of paper.

Simplify each expression.

$$1) \frac{3x^4y^7 \cdot 5x^3y^4 \cdot 6x}{5x^{-3}y^5}$$

$$2) \frac{(3pm^{-2}q^0)^{-2} \cdot 5m^{-4}p^6}{5pq^4}$$

Condense each expression into a single logarithm.

$$3) 5 \log m + 5 \log n - 5 \log p$$

$$4) \frac{1}{4} \ln d + \frac{1}{4} \ln e$$

Expand each logarithm.

$$5) \log \sqrt[5]{a \cdot b \cdot c}$$

$$6) \ln \frac{g^6h^4}{i^7}$$

Solve each equation. Round your answers to the nearest hundredth if necessary.

$$7) 6^{-5x} = 6^{3x-1}$$

$$8) 2^{r+2} = 1$$

$$9) 5^{4x-5} + 5 = 91$$

$$10) -8 \cdot 9^{-5x} = 49$$

$$11) \log_8(-32 - 3n) = \log_8(n^2 + 9n)$$

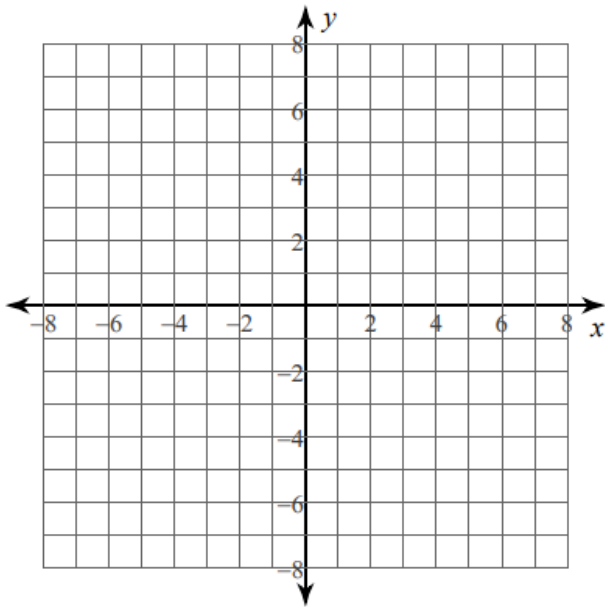
$$12) \log(3x - 9) = \log(2x + 6)$$

$$13) \log_6(x + 5) - \log_6 x = 2$$

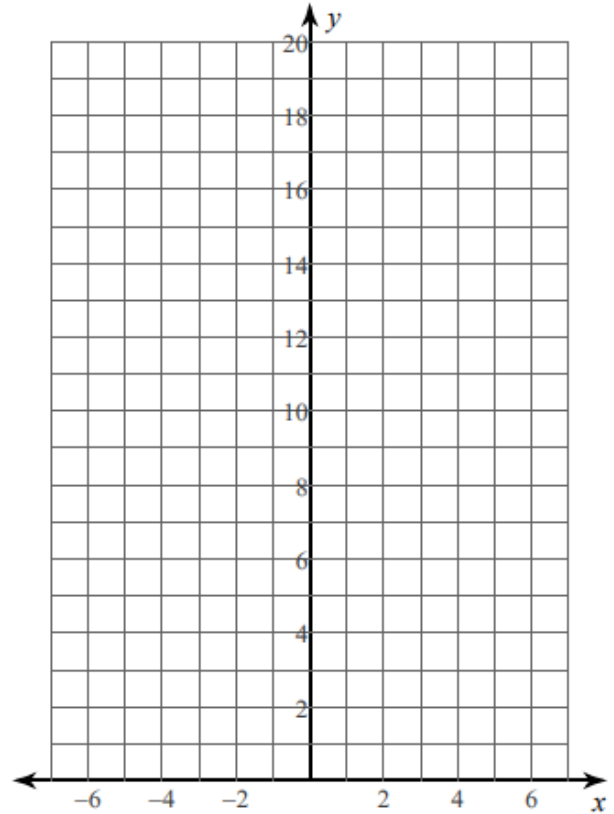
$$14) \ln(2x - 3) + \ln 3 = \ln 18$$

Graph each function. You MUST graph at least 2 points. NO RANDOM CURVES WILL BE ACCEPTED!

15) $y = \log(x + 2)$



16) $y = 2 \cdot 3^x$



Solve each problem. Be sure you answer the questions completely!

- 17) Brenda invests \$4,672 into a savings account with a fixed annual interest rate of 8% compounded quarterly. What will be the account balance after 5 years?
- 18) Jasmine invests \$6,231 into a retirement account with a fixed annual interest rate of 7% compounded continuously. What will be the account balance after 15 years?
- 19) Ryan invests a sum of money in a savings account with a fixed annual interest rate of 5% compounded monthly. After 9 years, the amount in the account is \$11,359.64. What was the amount of the initial investment?

- 20) Hakeem invests \$6,575 into an account that is compounded semi-annually. After 7 years, the amount in the account is \$11,385.77. What was the annual interest rate?
- 21) An adult takes 200 mg of ibuprofen. Each hour the amount of ibuprofen in the person's system decreases by about 29%. How much ibuprofen is left after 3 hours?
- 22) In 1970, the population of a city was about 278,000. Since then, the city population has grown at an average annual rate of 1.8%. About how many people lived in the city in 1985?
- 23) The half-life of Po-218 is three minutes. How much of a 2.0 gram sample would remain after 18 minutes?
- 24) Selenium-83 has a half-life of 25.0 minutes. How many minutes would it take for a 10.0 mg sample to decay and have only 0.625 mg of it remaining?