

11U U4 - Mid-unit Review

Learning Goal: The goal of this problem set is to help you strengthen your learning in Exponential Functions.

Success Criteria:

I can use the exponent laws

I can simplify exponential expressions, especially when the expressions have “sameness” (same base or same exponent)

Practice Problems - Solutions will be posted next week.

A few of these problems will be collected - which ones? You will be told tomorrow.

Multiple Choice

Circle (CLEARLY) the choice that best answers the question, AND write the letter of your choice beside the question.

1. Which of the following is equivalent to the expression 8^{-6} ?

a. $\sqrt[6]{8}$

c. $\frac{1}{8^6}$

b. $\frac{6}{8}$

d. $(-8)^6$

2. Which of the following is equivalent to the expression $(5^{-4})(5^7)$?

a. 5^3

c. 25^3

b. $\frac{1}{5^{28}}$

d. $\frac{1}{5^{11}}$

3. Which of the following is equivalent to 1?

a. $1^3 + 1^2$

c. $(-1)^3$

b. $5^{-4} \times 5^4$

d. $\frac{13^4}{13^{-4}}$

4. Evaluate $\left(\frac{4}{5}\right)^{-2}$.

a. $-\frac{16}{25}$

c. $\frac{5}{4}$

b. $\frac{4}{5}$

d. $\frac{25}{16}$

5. Evaluate $\left(\frac{3}{8}\right)^{-2} - \left(\frac{3}{10}\right)^{-2}$.

a. -36

c. $-\frac{2}{3}$

b. -4

d. $-\frac{81}{1600}$

14. Simplify the expression. Express your answer with positive exponents.

$$\left(\frac{(x^{12})^{0.25} (216x^9)}{(3x)^6 (x^{18})^{0.5}} \right)^{-\frac{1}{3}}$$

15. Evaluate. Express your answer in rational form.

$$-9^{-2} + \left(\frac{9^1}{6^2} \right)^{-1}$$

16. Evaluate the expression $(x^3)^n (y^{-n}) (x^y)$ for $x = -8, y = 2, n = -1$.

17. Evaluate. Explain how you found your answer.

$$\frac{(32^{0.4}) \left(32^{\frac{1}{5}} \right)}{32^{\frac{4}{5}}}$$

18. The surface area of a sphere is given by the formula: $SA_{(sphere)} = 4\pi r^2$. The surface area of a cylinder is given by the formula: $SA_{(cylinder)} = 2\pi r h + 2\pi r^2$. Determine the expression, in simplified form, that represents the ratio of surface area of a cylinder to a sphere. Use your formula to find the ratio of surface areas of a cylinder and sphere that both have radius 0.5 m and height 0.6 m.

19. Simplify the expression. Express your answer with positive exponents.

$$\left(\frac{(a^5 b^{-2})^{-3} (a^6 b^7)^{-1}}{(a^{-7} b^{-8})^{-4}} \right)^2$$

20. Determine the exponent that makes the equation true.

$$13^x = \frac{1}{2197}$$

21. Simplify.

$$\left(\frac{r^3 s^{-1}}{r^2 s^6} \right)^{-1}$$

22. Solve for x .

$$\sqrt[3]{\frac{1}{64}} + \left(\frac{243}{x} \right)^{\frac{2}{5}} = \sqrt{\frac{25}{4}}$$