

# Exponents and Exponential Function Practice

**Simplify.**

1.  $(3a^2b^5)(-2ab^3)$

1. \_\_\_\_\_

2.  $(w^3z^7)^3$

2. \_\_\_\_\_

3.  $4a^4b^8 + 2(ab^2)^4 + 4(a^2b^4)^2$

3. \_\_\_\_\_

**Simplify. Assume that no denominator is equal to zero.**

4.  $\frac{4a^{-3}d^2}{8a^2d^{-5}}$

4. \_\_\_\_\_

5.  $\frac{(3r^3t^5)^3}{(-3r^2t^7)^2}$

5. \_\_\_\_\_

**Simplify each expression.**

6.  $\sqrt{50x^3y^2}$

6. \_\_\_\_\_

7.  $\frac{5\sqrt{2}}{\sqrt{10}-3}$

7. \_\_\_\_\_

8. Describe how the graph of  $g(x) = 5(2^x)$  is related to the graph of  $f(x) = 2^x$ .

8. \_\_\_\_\_

9. Fungi A has a growth rate of 3.55% per minute, while Fungi B has a growth rate of 0.06% per second. Which fungus grows at a faster rate? By how much?

9. \_\_\_\_\_

**Solve each equation.**

10.  $125^{x-1} = 5$

10. \_\_\_\_\_

11.  $3^{3x+1} = 81$

11. \_\_\_\_\_

12.  $64^{2x+3} = 2$

12. \_\_\_\_\_

**Simplify.**

13.  $1000^{\frac{2}{3}}$

14.  $4^{\frac{5}{2}}$

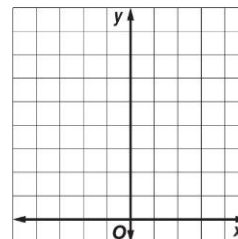
**Write each expression in radical form.**

15.  $57^{\frac{1}{4}}$

16.  $10x^{\frac{1}{3}}$

17. A weight lifter can bench-press 145 pounds. She plans to increase the weight  $W(x)$  in pounds that she is bench-pressing according to the function  $W(x) = 145(1.05)^x$ , where  $x$  represents the number of training cycles she completes. How much will she bench-press after 5 training cycles?

18. Graph  $y = \left(\frac{1}{6}\right)^x$ . Find the y-intercept and state the domain and range.



19. **ART** An oil painting originally cost \$2500 and increases in value at a rate of 6% per year. Find the value of the painting after 12 years.

20. **CARS** A new car valued at \$16,500 depreciates at a steady rate of 12% per year. What is the value of the car in 10 years?

13. \_\_\_\_\_

14. \_\_\_\_\_

15. \_\_\_\_\_

16. \_\_\_\_\_

17. \_\_\_\_\_

18. \_\_\_\_\_

19. \_\_\_\_\_

20. \_\_\_\_\_