# Review Worksheet: Sections 10.1–10.4

Topics: writing products using exponents, evaluating powers, exponent rules, and positive-exponent form

**Directions:** Show your work in the space provided. Simplify completely. When asked, write answers using **only positive exponents**.

## A. Write the product using exponents (Section 10.1).

1. $(-4)(-4)(-4)(-4)$

2. $5 \cdot 5 \cdot 5 \cdot n \cdot n$

3. $x \cdot x \cdot y \cdot y \cdot y$

4. $b \cdot b \cdot b \cdot b \cdot c \cdot c$

## B. Evaluate (Section 10.1).

5. $6^3$

6. $(-3)^4$

7. $(-2)^5$

8. $\left(\dfrac{3}{4}\right)^2$

## C. Simplify. Write your answer as a single power (Section 10.2).

9. $4^6 \cdot 4^2$

10. $\dfrac{9^{11}}{9^5}$

11. $(p^4)^3$

12. $(3x^2y^3)^2$

13. $\left(\dfrac{7}{3}\right)^5 \left(\dfrac{7}{3}\right)^{-1}$

## D. Simplify (Section 10.3).

14. $\dfrac{5^4 \cdot 5^9}{5^6}$

15. $\dfrac{r^{12} \cdot r^3}{r^7}$

16. $\dfrac{k^{14}}{k^5 \cdot k^6}$

17. $\left(\dfrac{3}{8}q\right)^2$

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**E. Rewrite using only positive exponents (Section 10.4).**

18. $6m^{-4}$

19. $\dfrac{15x^6}{3x^{-2}}$

20. $\dfrac{c^{-2}d^5}{c^4d^{-3}}$

21. $(5x^{-1}y^2)^{-2}$

22. $\dfrac{4}{z^{-3}}$

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**F. Applications (mixed 10.1–10.4).**

23. A bacterium is 1800 micrometers long. If 1 micrometer $= 10^{-6}$ meters, what is the length in meters?

24. A value is multiplied by $10^5$ and then divided by $10^2$. Overall, what power of 10 is the value multiplied by?

25. A factory produces $6 \times 10^3$ items per day. How many items are produced in $2 \times 10^2$ days? (Write your answer in standard form.)

**Quick Self-Check (optional):** Circle the rules you used: product of powers, quotient of powers, power of a power, negative exponent rule.