Unit 3, Test Review: **Name: _____**

Simplifying Exponential Expressions and Scientific Notation

Finish each rule.

1. $a^m \bullet a^n =$

2. $\left(a^m\right)^n =$

3. $(ab)^m =$

4. $\frac{a^m}{a^n} =$

5. $a^0 =$

6. $a^{-n} =$

Simplify the expression. The simplified expression should have no negative exponents.

7. $\left(x^5\right)^6$

8. $3x^2 \bullet \left(4x^3\right)^2$

9. $6^7 \bullet 6^9$

10. $(-2x)^4$

11. $(-5)^0 \bullet x$

12. $\left(\frac{1}{3}\right)^{-1}$

13. $\frac{4^5 \bullet 4^3}{4^2}$

14. $\frac{y^8}{y^9}$

15. $x^3 \bullet x^4 \bullet x^2$

16. $\frac{\left(x^3\right)^2}{\left(x^5\right)^3}$

17. $\left(x^2\right)^4$

18. $\left(3^{-2}\right)^{-1}$

19. $\left(\frac{2x^3y^2}{3xy}\right)^{-3}$

20. $\frac{1}{3x^{-3}}$

Rewrite the number in decimal form.

21. 4.3269×10^{3}

22. 7.1532×10^{-5}

Rewrite the number in scientific notation.

23. 0.0032

24. 1042000

Evaluate the expression without using a calculator. Write the result in decimal form.

25. $\left(6\times10^{-2}\right)\bullet\left(7\times10^{-3}\right)$

26. $\frac{7.85\times10^{26}}{6.02\times10^{23}}$

27. $\frac{\left(8.2\times10^{-3}\right)\left(-7.9\times10^{5}\right)}{7.3\times10^{16}}$

Simplify the expression. The simplified expression should have no negative exponents.

1. $2^3 \cdot 2^5$	2. $\left(y^2\right)^4$
3. $(-3x^3)^4$	4. 4^0
5. $\left(-3a^3\right)^3 \cdot \left(4a\right)^0$	6. $\left(-a^3b^5\right)^2 \left(a^4b\right)^2$
7. 3^{-5}	8. $\left(\frac{4}{7}\right)^{-2}$
9. $2^{-1} \cdot 2^5$	10. x^0y^{-4}
11. $5x^{-2}$	12. $\left(-5x^{-3}y^5\right)^2$
17. $\frac{6x^{-2}y^2}{3y^{-4}}$	18. $\left(-2x^2\right)^{-3}\left(4x^8\right)$

19. $\frac{15x^3z^{-5}}{25y^{-4}}$	20. $\frac{m^{-5}}{m^7 \cdot m^{-4}}$
21. $\frac{-20xy^8}{3x^{-4}y^2} \cdot \frac{-5x^{-3}y^5}{(-2y)^3}$	22. $\left(\frac{4x^{-3}y^2}{6xy^{-3}}\right)^{-2} \cdot \frac{y^4}{x^6y^{-5}}$

Write in Scientific Notation

23. 150 ,000	24. 0.000002

Write in Standard Form

25. $2.5x10^{-2}$	26. $3.069x10^6$

Multiply or Divide. Your final answer should be written in Scientific Notation.

27. $(2.6x10^{-2})(1.6x10^3)$	28. $(2.46x10^4)(5.5x10^5)$
29. $\frac{(4.9x10^{-1})}{(5.5x10^2)}$	30. $\frac{(4.56x10^3)}{(1.35x10^{-5})}$