Name _____ Date _____ Class _____

UNIT 6

Module 14: Exponent Operations Review

Simplify. Leave answer in terms with exponents.

1. $4^2 \cdot 4^4$
2. $\left(5^{-2}\right)^3$
3. $\frac{5^2}{5^5}$
4. $\left(\frac{3}{7}\right)^3$
5. $\frac{2^2}{2^{-9}}$
6. $(-9)(-9)^3$

Simplify the expression.

7. $a^6 \cdot a^3$
8. $\left(x^5\right)^2$
9. $\left(4a^2b^3\right)^5$
10. $\frac{x^8}{x^6}$
11. $\frac{x^5}{x^8}$
12. $\frac{x^6}{x^6}$
13. $\left(\frac{4a^3}{2b^4}\right)^2$
14. $\left(2^3x^2\right)^5$
15. $\left(x^4y^7\right)^{-3}$
16. $\frac{x^{11}y^{10}}{x^{-3}y^{-1}}$
17. $-3x^{-4}y^0$
18. $\frac{5x^3y^9}{20x^2y^{-2}}$
19. $\frac{x^5}{x^{-2}}$
20. $\frac{x^5y^2}{x^4y^0}$
21. $\left(x^3\right)^0$

22. $(10x^5y^3)^{-3}$

23. $\frac{x^{-1}y}{xy^{-2}}$

24. $(4x^2y^5)^{-2}$

25. $\frac{2x^2y}{6xy^{-1}}$

26. $\frac{xy^9}{3y^{-2}} \bullet \frac{-7y}{21x^5}$

27. $\frac{12xy}{7x^4} \bullet \frac{7x^5y^2}{4y}$

28. $\left(\frac{b^2}{a^3}\right)^4 =$

29. $3x^2y \bullet -5x^3y^4 =$

30. $\left(\frac{24x^5y^4}{3x^{-2}y}\right)\left(\frac{2xy^2}{3xy}\right)^2 =$

Name Answer Key Date _____ Class _____

UNIT 6

Module 14: Exponent Operations Review

Simplify. Leave answer in terms with exponents.

1. $4^2 \cdot 4^4$ 4^{2+4} 4^6

2. $(5^{-2})^3$ $5^{-6} = \frac{1}{5^6}$

3. $\frac{5^2}{5^5}$ $5^{2-5} = 5^{-3} = \frac{1}{5^3}$

4. $\left(\frac{3}{7}\right)^3$ $\frac{3^3}{7^3}$

5. $\frac{2^2}{2^{-9}}$ $2^{2-(-9)} = 2^{11}$

6. $(-9)^1(-9)^3 = (-9)^{1+3} = (-9)^4$

Simplify the expression.

7. $a^6 \cdot a^3$ $a^{6+3} = a^9$

8. $(x^5)^2$ $x^{2 \cdot 5} = x^{10}$

9. $(4a^2b^3)^5 = 4^5 \cdot a^{10} \cdot b^{15}$
$= 1024a^{10}b^{15}$

10. $\frac{x^8}{x^6}$ $x^{8-6} = x^2$

11. $\frac{x^5}{x^8}$ $x^{5-8} = x^{-3} = \frac{1}{x^3}$

12. $\frac{x^6}{x^6} = 1$

13. $\left(\frac{4a^3}{2b^4}\right)^2 = \frac{4^2 \cdot a^6}{2^2 \cdot b^4} = \frac{16a^6}{4b^4}$
$= \frac{4a^6}{b^4}$

14. $(2^3x^2)^5 = 2^{15} \cdot x^{10}$
$= 32{,}768x^{10}$

15. $(x^4y^7)^{-3} = \frac{1}{(x^4y^7)^3} = \frac{1}{x^{12}y^{21}}$

16. $\frac{x^{11}y^{10}}{x^{-3}y^{-1}}$ $x^{11-(-3)} \cdot y^{10-(-1)}$
$x^{14}y^{11}$

17. $-3x^{-4}y^0$ $\frac{-3}{x^4}$

18. $\frac{5x^3y^9}{20x^2y^{-2}} = \frac{1x^{3-2}y^{9-(-2)}}{4}$
$\frac{x^1y^{11}}{4}$

19. $\frac{x^5}{x^{-2}}$ $x^{5-(-2)}$
x^7

20. $\frac{x^5y^2}{x^4y^0}$ $\frac{x^{5-4} \cdot y^2}{1}$
x^1y^2

21. $(x^3)^0 = 1$

22. $(10x^5y^3)^{-3}$ $\frac{1}{(10x^5y^3)^3}$

$\frac{1}{10^3 \cdot x^{15} \cdot y^9}$

$\frac{1}{1000x^{15}y^9}$

23. $\frac{x^{-1}y}{xy^{-2}} = x^{-1-1} \cdot y^{1-(-2)}$

$x^{-2} \cdot y^3$

$\frac{y^3}{x^2}$

24. $(4x^2y^5)^{-2}$ $\frac{1}{(4x^2y^5)^2}$

$\frac{1}{16x^4y^{10}} \leftarrow \frac{1}{4^2x^4y^{10}}$

25. $\frac{2x^2y}{6xy^{-1}}$

$\frac{1x^{2-1}y^{1-(-1)}}{3}$

$\frac{x^1y^2}{3}$

26. $\frac{xy^9}{3y^{-2}} \bullet \frac{-7y}{21x^5}$

$\frac{-7xy^{9+1}}{63x^5y^{-2}}$

$\frac{-7x^1y^{10}y^2}{63x^5}$

$\frac{-1y^{12}}{9x^4}$

27. $\frac{\cancel{12}^{3}xy}{\cancel{7}x^4} \bullet \frac{\cancel{7}x^5y^2}{\cancel{4}_{1}y} = \frac{3x^6y^3}{x^4y^1}$

$= 3x^2y^2$

28. $\left(\frac{b^2}{a^3}\right)^4 = \frac{b^8}{a^{12}}$

29. $3x^2y \bullet -5x^3y^4 =$

$-15x^{2+3}y^{1+4}$

$-15x^5y^5$

30. $\left(\frac{24x^5y^4}{3x^{-2}y}\right)\left(\frac{2xy^2}{3xy}\right)^2 =$

$\left(\frac{8x^7y^3}{}\right)\left(\frac{2^2x^2y^4}{3^2x^2y^2}\right)$

$\left(\frac{8x^7y^3}{}\right)\left(\frac{4y^2}{}\right)$

$32x^7y^5$