Name _____ Date _____

Polynomials

Raising Exponents to a Power and Multiplying Exponents

Rule: $(x^a)^b = x^{ab}$ Example: $(x^2y^3)^3 = x^6y^9$
Rule: $x^a \cdot x^b = x^{a+b}$ Example: $x^3 \cdot x^5 = x^8$

Multiply the polynomials.

1. $(-4xy^3)^3 =$

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

3. $(-6x^4y^6)^3 =$

4. $(5x^2y^4)^3 =$

5. $(6x^5y^4)^3 =$

6. $(2x)^4 =$

7. $(-3x^2y)^3 =$

8. $(x^3y)^2 =$

9. $(-2x^2y)^4 =$

10. $(x^2y^3)(x^3y^2) =$

11. $(-4x^3y^3)^4 =$

12. $(3xy^3)(-4x^2y^4)^2(xy^3) =$

13. $(-3x^3y)^3 =$

14. $(-2x^4y^5)^3 =$

15. $(3x^2y^3)^4 =$

16. $(6x^2y^3)^0 =$

17. $(x^3y^3)^3 =$

18. $(5xy^3)(-5xy^2) =$

19. $(-3x^2y^3)^2 =$

20. $(8xy)^2 =$

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ynomials

Negative Exponents

Rule: $x^{-a} = \frac{1}{x^a}$ Example: $4^{-2} = \frac{1}{16}$ Example: $4x^{-2} = \frac{4}{x^2}$ Example: $(2x)^{-3} = \frac{1}{8x^3}$

$4^{-2} = \frac{1}{4^2} = \frac{1}{16}$ $\frac{1}{(2x)^3} = \frac{1}{8x^3}$

Simplify.

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