	Expanded Form	Simplified
1. $a^5 \cdot a^2$		
2. $\left(a^5\right)^2$		
3. $\left(4a^2\right)^3$		
4. $\left(3a^2b^3\right)^4$		

$3 \cdot 4^2 =$ $\qquad$ $\left(3 \cdot 4\right)^2 =$

$\left(-3 \cdot 4\right)^2 =$ $\qquad$ $-\left(3 \cdot 4\right)^2 =$

Rules for Multiplying Monomials

Product of Powers	$a^m \cdot a^n$	
Power of a Power	$\left(a^m\right)^n$	
Power of Products	$\left(ab\right)^m$	
Power of a Monomial	$\left(a^m b^n\right)^p$	

Examples- Simplify the following:

5. $\left(\frac{1}{2}a^2b\right)^3$	6. $\left(2a^4\right)\left(3a^3b\right)\left(-4a^2b^3\right)^2$
7. $9\left(\frac{1}{3}a^3b^4\right)^2$	8. $\left(-4x^5\right)^3$
9. $\left(-5a^3\right)^2 + \left(3a\right)^3$	10. $\left(5a^3\right)^2 + \left(2a^2\right)^3$

	Expanded Form	Simplified
11. $\frac{a^5}{a^3}$		
12. $\frac{a^3}{a^5}$		
13. $\frac{4a^2b^3}{8ab^5}$		
14. $\frac{a^4}{a^4}$		

Rules for Dividing Monomials

Quotient of Powers	$\frac{a^m}{a^n}$	
Zero Exponent	a^0	
Negative Exponent	a^{-1}	

Examples- Simplify the following:

15. $\frac{144x^5y^{-3}z^4}{12x^6y^2z^4}$	16. $\frac{\left(3x^5\right)^2}{\left(-2x^3\right)^{-3}}$
17. $\frac{x^5y^2}{xy^3}$	18. $\left(\frac{2a^3}{b^{-4}}\right)^{-2}$
19. $\frac{\left(x^4y^{-7}\right)^0}{\left(-3\right)^2}$	20. $\frac{1}{x^0 + y^0}$

Degree of a Polynomial: the degree of the monomial with the greatest degree.

What is the degree of:

$f(x) = 6x^7 + 9x^2 + 3x^{10}$	$f(x) = x^2 + 2x^3 - x$

Simplify:

1. $\left(4x^3 + 4x^2 - 3x\right) + \left(-5x^3 - 2x^2 - 4\right)$	2. $\left(-4x^3 + 6x^2 - 3\right) - \left(3x^4 + 4x^2 + 7x + 12\right)$

Multiplying Polynomials: Distribute, combine like terms, and write in descending order.

3. $\left(x - 5\right)\left(x^2 - 2x + 3\right)$	4. $\left(2x^3 + 5x^2 - 6x + 1\right)\left(3x - 2\right)$