

# 5.5 Dividing Polynomials

ex:

$$\frac{X^6}{X} = \frac{\cancel{X} \cdot X \cdot X \cdot X \cdot X \cdot X}{\cancel{X}}$$

$$\frac{1}{2} \cdot \frac{2}{1}$$

$$= X^5$$

$$\frac{y^{10}}{y^4} = y^6$$

Product Rule	
multiply	$b^m \cdot b^n = b^{m+n}$
Dividing	Quotient Rule
	$\frac{b^m}{b^n} = b^{m-n}$

$$b. \frac{y^{19}}{y^6} = y^{19-6} = y^{13}$$

ex:

$$\frac{X^3}{X^3} = \frac{X \cdot X \cdot X}{\cancel{X} \cdot \cancel{X} \cdot \cancel{X}} = 1 \quad \frac{X^3}{X^2} =$$

$$\frac{2^1}{2^1} = 1 \quad 2^{1-1} = 2^0 = 1$$

$$\frac{4x^2}{4x^2} = 1$$

$$\frac{X^{459}}{X^{459}} = 1$$

$$X^{459-459} = X^0 = 1$$

(exponent)  
Zero power rule

$$b^0 = 1 \quad b \neq 0$$

$0^0$  undefined  
or  
indeterminate

$$12. \quad 4^0 = 1$$

$$14. \quad (-4)^0 = 1$$

$$16. \quad -4^0 = -1$$

$$18. \quad 200y^0 = 200 \cdot 1 \\ = 1 = 200$$

$$24. \quad -\sqrt{3^0} - (-\sqrt{3})^0 \\ -\sqrt{1} - (1) \\ -1 - 1 \\ = -2$$

Distributing  
Power

$$26. \quad \left(\frac{x}{5}\right)^2 = \frac{x^2}{5^2} \\ = \frac{x^2}{25}$$

$$(ab)^n = a^n b^n$$

$$30. \quad \left(\frac{3x^4}{7}\right)^2 = \frac{3^2(x^4)^2}{7^2} = \frac{9x^8}{49}$$

$$\text{or } \left(\frac{3x^4}{7}\right)\left(\frac{3x^4}{7}\right) = \frac{9x^8}{49}$$

$$38. \quad \frac{45x^{12}}{15x^4} = \frac{3x^{12-4}}{1} = 3x^8$$

$$48. \quad \frac{-15x^{16}y^2}{45x^2y^2} = \frac{-1x^{16-2}y^{2-2}}{3} \\ = -\frac{x^{14}}{3} \quad \text{or } -\frac{1}{3}x^{14}$$

Polynomials

$$70. \quad \frac{9x^3 + 12x^2 - 3x}{3x}$$

$$= \frac{9x^3}{3x} + \frac{12x^2}{3x} - \frac{3x}{3x}$$

$$= 3x^2 + 4x - 1$$

divide  
each  
term