

$$\frac{3}{4}x^2(8x + 12y - 16xy^2)$$

$$\frac{3}{4} \cdot \frac{8}{1} = \frac{24}{4} = 6$$

$$6x^3 + 9x^2y - 12x^3y^2$$

$$\frac{3}{4} \cdot \frac{12}{1} = \frac{36}{4} = 9$$

$$\frac{3}{4} \cdot \frac{-16}{1} = \frac{-48}{4} = -12$$

# DIVIDING POLYNOMIALS

Ways to write a division problem:

Fraction bar:  $\frac{x^2 + 5x - 7}{x + 2}$  ← DIVIDEND  
← DIVISOR

DIVISION SYMBOL:  $(x^2 + 5x - 7) \div (x + 2)$

LONG DIVISION BAR:  $x + 2 \overline{) x^2 + 5x - 7}$

POWER OF NEGATIVE 1:  $(x^2 + 5x - 7) \cdot (x + 2)^{-1}$   
DIVIDE BY ME  
AVA

# DIVIDING BY A SINGLE TERM (MONOMIAL)

$$\frac{4x^3y^2 + 8xy^2 - 12x^2y^3}{4xy}$$

$$\frac{4x^3y^2}{4xy} + \frac{8xy^2}{4xy} - \frac{12x^2y^3}{4xy}$$

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

$$x^2y + 2y - 3xy^2$$

$$\frac{9a^3b^2 - 18a^2b^3}{3a^2b}$$

$$\frac{9a^3b^2}{3a^2b} - \frac{18a^2b^3}{3a^2b}$$

$$3ab - 6b^2$$

# DIVIDING BY MORE THAN ONE TERM: (POLYNOMIAL)

$$\begin{array}{r} \underline{x+2} \overline{) x^2 + 5x - 7} \\ \underline{-(x^2 + 2x)} \phantom{- 7} \\ 3x - 7 \\ \underline{-(3x + 6)} \\ \phantom{3x} -13 \end{array}$$

○ -13 remainder

What do we multiply  $x$  by  
to get  $x^2$ ?

ANSWER:  $x+3 + \frac{-13}{x+2}$

$$\frac{4x^4 + 3x^2 + 12x}{2}$$

$$\underline{a^4 - 5a^3 - 13a^2 + 10}$$

$$a+1 \quad a^3 - 6a^2 - 7a + 7$$

$$a+1 \quad \left| \begin{array}{r} a^4 - 5a^3 - 13a^2 + 0a + 10 \\ - (a^4 + a^3) \end{array} \right.$$

$$\begin{array}{r} -6a^3 - 13a^2 \\ - (-6a^3 - 6a^2) \end{array}$$

$$a^3 - 6a^2 - 7a + 7 + \frac{3}{a+1}$$

$$\begin{array}{r} -7a^2 + 0a \\ - (-7a^2 - 7a) \end{array}$$

$$\begin{array}{r} 7a + 10 \\ - (7a + 7) \end{array}$$

3 Remainder

$$(x^3 - 4x^2)(x-4)^{-1}$$

$$\begin{array}{r} \textcircled{x^2 + 0x + 0} \\ \hline x-4 \overline{) x^3 - 4x^2 + 0x + 0} \\ \underline{-(x^3 - 4x^2)} \phantom{+ 0x + 0} \\ 0x^2 + 0x + 0 \\ \underline{-(0x^2 - 0x)} \phantom{+ 0} \\ 0x + 0 \\ \underline{-(0x - 0)} \\ 0 \end{array}$$

$$(x^3 - 27) \div (x - 3)$$

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