

5-2 Practice

Dividing Polynomials

Simplify.

1. $\frac{6k^2m - 12k^3m^2 + 9m^3}{2km^2}$

$$\frac{m(6k^2 - 12k^3m + 9m^2)}{2km^2 \leftarrow m \cdot m}$$

$$\boxed{\frac{6k^2 - 12k^3m + 9m^2}{2km}}$$

$$\frac{6k^2m - 12k^3m^2 + 9m^3}{2km^2} = \frac{3k}{m} - 6k^2 + \frac{9m}{2k}$$

OR

$$\frac{-30x^3y}{-6x^2y} + \frac{12x^2y^2}{-6x^2y} - \frac{18x^2y}{-6x^2y}$$

$$= 5x - 2y - 3$$

$$\boxed{= 5x - 2y + 3}$$

2. $(-30x^3y + 12x^2y^2 - 18x^2y) \div (-6x^2y)$

$$\frac{-30x^3y + 12x^2y^2 - 18x^2y}{-6x^2y}$$

$$= \frac{-6x^2y(5x - 2y + 3)}{-6x^2y}$$

$$\boxed{= 5x - 2y + 3}$$

OR

Use Long Division to simplify the quotient

3. $\frac{f^2 + 7f + 10}{f + 2}$

$$\begin{array}{r} f + 5 \\ f + 2 \overline{) f^2 + 7f + 10} \\ \underline{-(f^2 + 2f)} \\ 5f + 10 \\ \underline{-(5f + 10)} \\ 0 \end{array}$$

$$\boxed{f + 5}$$

4. $\frac{4x^2 - 2x + 6}{2x - 3}$

$$\begin{array}{r} 2x + 2 \\ 2x - 3 \overline{) 4x^2 - 2x + 6} \\ \underline{-(4x^2 - 6x)} \\ 4x + 6 \\ \underline{-(4x - 6)} \\ 12 \end{array}$$

$$\boxed{2x + 2 + \frac{12}{2x - 3}}$$

5. $(a^3 - 64) \div (a - 4)$

$$\begin{array}{r} a^2 + 4a + 16 \\ a - 4 \overline{) a^3 + 0a^2 + 0a - 64} \\ \underline{-(a^3 - 4a^2)} \\ 4a^2 + 0a - 64 \\ \underline{-(4a^2 - 16a)} \\ 16a - 64 \\ \underline{-(16a - 64)} \\ 0 \end{array}$$

$$\boxed{a^2 + 4a + 16}$$

6. $\frac{2h^4 - h^3 + h^2 + h - 3}{h^2 - 1}$

$$\begin{array}{r} 2h^2 - h + 3 \\ h^2 + 0h - 1 \overline{) 2h^4 - h^3 + h^2 + h - 3} \\ \underline{-(2h^4 + 0h^3 - 2h^2)} \\ -h^3 + 3h^2 + h - 3 \\ \underline{-(-h^3 + 0h^2 + h)} \\ 3h^2 + 0h - 3 \\ \underline{-(3h^2 + 0h - 3)} \\ 0 \end{array}$$

$$\boxed{2h^2 - h + 3}$$

HW 5.2 Part 2

Use Synthetic Division to simplify the following

** remember every term counts*

7. $\frac{2x^3 + 6x + 152}{x + 4}$

$$\begin{array}{r|rrrr} -4 & 2 & 0 & 6 & 152 \\ & \downarrow & -8 & 32 & -144 \\ \hline & 2 & -8 & 36 & 8 \end{array}$$

$$\boxed{2x^2 - 8x + 36 + \frac{8}{x+4}}$$

8. $(3w^3 + 7w^2 - 4w + 3) \div (w + 3)$

$$\begin{array}{r|rrrr} -3 & 3 & 7 & -4 & 3 \\ & \downarrow & -9 & 6 & -6 \\ \hline & 3 & -2 & 2 & -3 \end{array}$$

$$\boxed{3w^2 - 2w + 2 - \frac{3}{w+3}}$$

9. $(6y^4 + 15y^3 - 28y^2 - 6) \div (y + 2)$

$$\begin{array}{r|rrrrr} -2 & 6 & 15 & -28 & 0 & -6 \\ & \downarrow & -12 & -6 & -68 & 136 \\ \hline & 6 & 3 & 34 & -68 & 130 \end{array}$$

$$6y^3 + 3y^2 + 34y - 68 + \frac{130}{y+2}$$

10. $(x^4 - 3x^3 - 11x^2 + 3x + 10) \div (x - 5)$

$$\begin{array}{r|rrrrr} 5 & 1 & -3 & -11 & 3 & 10 \\ & \downarrow & 5 & 10 & -5 & -10 \\ \hline & 1 & 2 & -1 & -2 & 0 \end{array}$$

$$\boxed{x^3 + 2x^2 - x - 2}$$

11. $\frac{6x^2 - x - 7}{3x + 1}$

$3x + 1 = 0$
 $3x = -1$
 $x = -\frac{1}{3}$

$$\begin{array}{r|rrr} -\frac{1}{3} & 6 & -1 & -7 \\ & \downarrow & -2 & 1 \\ \hline & 6 & -3 & -6 \\ & 6x & -3 & -\frac{6}{3x+1} \\ \hline & \frac{6}{3} & \frac{-3}{3} & \frac{-6}{3} \end{array}$$

divide by 3 →

$$\boxed{2x - 1 - \frac{2}{3x+1}}$$

25. **GEOMETRY** The area of a rectangle is $2x^2 - 11x + 15$ square feet. The length of the rectangle is $2x - 5$ feet. What is the width of the rectangle? Use the method of your choice and check your answer!!!

$$\begin{array}{r} x-3 \\ 2x-5 \overline{) 2x^2 - 11x + 15} \\ \underline{-(2x^2 - 5x)} \\ -6x + 15 \\ \underline{-(-6x + 15)} \\ 0 \end{array}$$

width → $\boxed{x-3}$

$2x - 5 = 0$

$2x = 5$
 $x = \frac{5}{2}$

$$\begin{array}{r|rrr} \frac{5}{2} & 2 & -11 & 15 \\ & \downarrow & 5 & -15 \\ \hline & 2 & -6 & 0 \end{array}$$

$$\frac{2x-6}{2} \quad \frac{0}{2}$$

** divide by 2* →

width → $\boxed{x-3}$