

Name:

Date:

Period:

6.6 Dividing Polynomials Notes

Review!

Dividing by a monomial

$$1. \frac{6x^4 - 15x^3 + 3x^2}{3x^2} \quad 6.1$$

$$\frac{\cancel{6}x^4}{\cancel{3}x^2} - \frac{\cancel{15}x^3}{\cancel{3}x^2} + \frac{\cancel{3}x^2}{\cancel{3}x^2}$$

$$2x^2 - 5x + 1$$

$$2. \frac{21a^5b^3 - 14a^3b^2 + 63a^2b}{7ab}$$

$$\frac{\overset{3}{2}a^5b^3}{\cancel{7}ab} - \frac{\overset{2}{14}a^3b^2}{\cancel{7}ab} + \frac{\overset{9}{63}a^2b}{\cancel{7}ab}$$

$$3a^4b^2 - 2a^2b + 9a$$

You can only simplify to 1 if factors are the same.
Dividing

By a Binomial

$$\frac{3 \cdot a}{3} \stackrel{?}{=} a \quad \checkmark$$

$$\frac{3+a}{a} \stackrel{?}{=} 3 \quad \times$$

$$3. \frac{w^2 - 7w + 10}{w - 5} \quad \text{Factor numerator}$$

$$\frac{\cancel{(w-5)}(w-2)}{\cancel{(w-5)}}$$

$$w - 2$$

Factors can only be simplified to 1

$$4. (4h^2 - 7h - 2) \div (h - 2)$$

$$\frac{4h^2 - 7h - 2}{h - 2}$$

$$\frac{(4h+1)\cancel{(h-2)}}{\cancel{(h-2)}}$$

$$4h + 1$$

Long Division

divisor $\overline{)$ quotient
dividend

Numeric Example:

$$\begin{array}{r} 1193 \\ 7 \overline{) 8352} \\ \underline{-7} \\ 13 \\ \underline{-7} \\ 65 \\ \underline{-63} \\ 22 \\ \underline{21} \\ 1 \end{array}$$

1 remainder

$1193 + \frac{1}{7}$ ← remainder
← divisor
is written as a mixed number when numeric.

missing k^2 term - input $0k^2$

5. $(x^2 + 3x - 43) \div (x + 8)$

$$\begin{array}{r} x - 5 \\ (x+8) \overline{) x^2 + 3x - 43} \\ \underline{-(x^2 + 8x)} \\ -5x - 43 \\ \underline{-(-5x - 40)} \\ -3 \end{array}$$

$\frac{x^2}{x} = x$
 $x(x+8)$
 $x^2 + 8x$

$\frac{-5x}{x} = -5$
 $-5(x+8)$
 $-5x - 40$

-3 remainder

$x - 5 - \frac{3}{x+8}$

6. $(k^3 - 17k + 32) \div (k + 5)$

$$\begin{array}{r} k^2 - 5k + 8 \\ k+5 \overline{) k^3 + 0k^2 - 17k + 32} \\ \underline{-(k^3 + 5k^2)} \\ -5k^2 - 17k \\ \underline{-(-5k^2 - 25k)} \\ 8k + 32 \\ \underline{-(8k + 40)} \\ -8 \end{array}$$

$k^2 - 5k + 8 - \frac{8}{k+5}$

7. $(2x^3 - 7x^2 + 16x + 19) \div (x^2 - 2x - 7)$

$$\begin{array}{r} 2x - 3 \\ x^2 - 2x - 7 \overline{) 2x^3 - 7x^2 + 16x + 19} \\ \underline{-(2x^3 - 4x^2 - 14x)} \\ -3x^2 + 30x + 19 \\ \underline{-(-3x^2 + 6x + 21)} \\ 24x - 2 \end{array}$$

$\frac{2x^3}{x^2} = 2x$
 $2x(x^2 - 2x - 7)$
 $2x^3 - 4x^2 - 14x$

$2x - 3 + \frac{24x - 2}{x^2 - 2x - 7}$