

Turn in p. 148 16 – 30 even to the black box in front of the projector!

3.7 Divide Polynomials

Turn to: Workbook p. 170

Divide 456 by 12 without a calculator



Divide $10x^3 - 25x^2 + 15x$ by $5x$.

Solution

Method 1: Write the division as a fraction.

$$(10x^3 - 25x^2 + 15x) \div 5x$$

$$= \frac{10x^3 - 25x^2 + 15x}{5x}$$

Write as a fraction.

$$= \frac{10x^3}{5x} - \frac{25x^2}{5x} + \frac{15x}{5x}$$

Divide each term by $5x$.

$$= \underline{2x^2 - 5x + 3}$$

Simplify.



Method 2: Use long division.

Think:
 $10x^3 \div 5x = ?$

Think:
 $-25x^2 \div 5x = ?$

Think:
 $15x \div 5x = ?$

$2x^2 - 5x + 3$

$$5x \overline{) 10x^3 - 25x^2 + 15x}$$

$$(10x^3 - 25x^2 + 15x) \div 5x = \underline{2x^2 - 5x + 3}$$

To check your answer, multiply the quotient by the divisor.



1. Divide $(12x^3 + 9x^2 - 3x)$ by $3x$.

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

$$3x$$

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

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

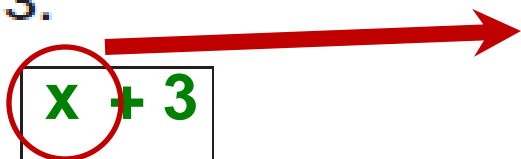


Divide $2x^2 + 9x - 6$ by $2x + 3$.

$$2x^2 + 9x - 2x^2 - 3x$$

Solution

First divide the first term of $2x^2 + 9x - 6$ by the first term of $2x + 3$.



$$x(2x + 3) = 2x^2 + 3x$$

$$\begin{array}{r} 2x + 3 \overline{) 2x^2 + 9x - 6} \\ \underline{-(2x^2 + 3x)} \\ 6x - 6 \end{array}$$

Multiply x and $2x + 3$.

Subtract $2x^2 + 3x$. Bring down -6 . Divide the first term of $6x - 6$ by the first term of $2x + 3$.

$$\begin{array}{r} \overline{) 6x - 6} \\ \underline{-(6x + 9)} \\ -15 \end{array}$$

Multiply 3 and $2x + 3$.

Subtract $6x + 9$.

$$(2x^2 + 9x - 6) \div (2x + 3) = x + 3 + \frac{-15}{2x + 3}$$



$$2. (3x^2 - x - 14) \div (3x - 7)$$

$$\underline{3x^2 - x - 14}$$

$$3x - 7$$

$$x + 2$$

$$3x - 7 \overline{) 3x^2 - x - 14}$$
$$-\underline{(3x^2 - 7x)}$$

$$6x - 14$$

$$-\underline{(6x - 14)}$$

$$0$$

$$3x^2 - x - 3x^2 - -7x$$



$$3. (6x^2 - 13x + 11) \div (3x - 5)$$

$$\underline{6x^2 - 13x + 11}$$

$$3x - 5$$

$$\begin{array}{r} 2x - 1 \\ 3x - 5 \overline{) 6x^2 - 13x + 11} \\ \underline{-(6x^2 - 10x)} \\ -3x + 11 \\ \underline{-(-3x + 5)} \\ 6 \end{array}$$

$$2x - 1 + \frac{6}{3x - 5}$$



Divide $4x^2 - 11$ by $-3 + 2x$.

$$\begin{array}{r}
 \boxed{2x + 3} \\
 2x - 3 \overline{) 4x^2 + 0x - 11} \\
 \underline{-(4x^2 - 6x)} \\
 6x - 11 \\
 \underline{-(6x - 9)} \\
 -2
 \end{array}$$

$$(4x^2 - 11) \div (-3 + 2x) = \underline{2x + 3 + \frac{-2}{2x - 3}}$$

Rewrite polynomials. Insert missing term.

Multiply $2x$ and $2x - 3$.

Subtract $4x^2 - 6x$. Bring down -11 .

Multiply 3 and $2x - 3$.

Subtract $6x - 9$.



$$4. (6 - 2x + x^2) \div (2 + x)$$

$$\underline{x^2 - 2x + 6}$$

$$x + 2$$

$$\begin{array}{r} \\ x+2 \overline{) x^2 - 2x + 6} \\ \underline{-(x^2 + 2x)} \\ -4x + 6 \\ \underline{-(-4x - 8)} \\ 14 \end{array}$$

$$x - 4 + \frac{14}{x + 2}$$



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

$$\underline{6x^2 - 13x + 11}$$

$$x - 5$$

$$\begin{array}{r} 2x - 1 \\ 3x - 5 \overline{) 6x^2 - 13x + 11} \\ \underline{-(6x^2 - 10x)} \end{array}$$

$$\begin{array}{r} -3x + 11 \\ \underline{-(-3x + 5)} \end{array}$$

$$6$$

$$2x - 1 + \frac{6}{3x - 5}$$

Homework p. 159 2 – 10 even

Due Today

