

Warm Up

1. Simplify: $(x + 3)(2x - 1)$

$$\begin{array}{|c|c|} \hline x & 3 \\ \hline 2x & 2x^2 & 6x \\ \hline -1 & -x & -3 \\ \hline \end{array} \quad 2x^2 - 5x - 3$$

2. Simplify: $(x + 2)^3 - 4x + 10$

$$x^3 + 6x^2 + 8x + 10$$

3. Correct the error

There is an error in the student work shown below:

Question: Multiply $(3x^2 + x - 8)(x - 1)$.

Solution:

$$\begin{aligned} (3x^2 + x - 8)(x - 1) &= \\ &= 3x^3 + x^2 - 8x - 3x^2 - x + 8 \\ &= 3x^3 - 4x - 9x + 8 \\ \text{The answer is } &3x^3 - 4x^2 - 9x + 8 \end{aligned}$$

$$3x^3 - 2x^2 - 9x + 8$$

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ACT Question of the Day

1. The weekly fee for staying at the Pleasant Lake Campground is \$20 per vehicle and \$10 per person. Last year, weekly fees were paid for v vehicles and p persons. Which of the following expressions gives the total amount, in dollars, collected for weekly fees last year?

- A. $20v + 10p$
- B. $20p + 10v$
- C. $10(v + p)$
- D. $30(v + p)$
- E. $10(v + p) + 20p$

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Whiteboard Practice

Add or subtract.

1. $(3x^3 + 4x^2 + 1) + (2x^2 + 10)$

2. $(-4x^2 + 3x - 1) - (4x + 2)$



4. $(7x^3 + 6x^2 + x - 1) + (9x^3 + 4x^2 - x + 10)$

Multiply

5. $(2n + 2)(6n + 1)$

6. $(4n + 1)(2n + 6)$



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Long Division of Polynomials

Divide without using your calculator !!

5798 / 2

$$\begin{array}{r} 2899 \\ 2 \overline{) 5798} \\ \underline{-4} \\ 17 \\ \underline{-16} \\ 19 \\ \underline{18} \\ 18 \\ \underline{18} \\ 0 \end{array}$$

$$\begin{array}{r} 2899 \\ 2 \overline{) 5798} \\ \underline{-4} \\ 17 \\ \underline{-16} \\ 19 \\ \underline{18} \\ 18 \\ \underline{18} \\ 0 \end{array}$$

Stop and Jot: Write out the steps for long division

1. How many times does my divisor go into the 1st #
2. put my answer from step 1 at the top, then multiply it by the divisor.
3. put step 2 under the 1st # and subtract.
4. bring the next number down.
5. repeat steps 1-4 w/ 17

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Turn and talk with your partner for 1 minute to compare your steps for long division. Be ready to share out with the group.

Long Division

Ex 1: Divide $(x^2 + 7x + 10) \div (x + 2)$

↙
Dividend

↑
Divisor

Answer = Quotient

Long Division

$$(x^3 + 3x^2 - 4x - 12) \div (x + 2)$$

$$\begin{array}{r}
 x^2 + x - 6 \\
 x + 2 \overline{) x^3 + 3x^2 - 4x - 12} \\
 \underline{-x^3 + 2x^2} \\
 5x^2 - 4x - 12 \\
 \underline{-5x^2 + 10x} \\
 16x - 12 \\
 \underline{-16x + 32} \\
 44
 \end{array}$$

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

$$x^3 + 3x^2 - 4x - 12 = (x+2)(x^2 + x - 6)$$

If the remainder is 0, the divisor is a factor of the polynomial.

Long Division

$$(5x^3 - 10x^2 + 3x - 6) \div (x - 2)$$

$$\begin{array}{r}
 5x^2 + 3 \\
 x - 2 \overline{) 5x^3 - 10x^2 + 3x - 6} \\
 \underline{-5x^3 + 10x^2} \\
 0x^3 + 3x - 6 \\
 \underline{-0x^3 + 6x} \\
 3x - 6 \\
 \underline{-3x + 6} \\
 0
 \end{array}$$

$\frac{5x^3}{x} = 5x^2$
 $\frac{0x^2}{x} = 0$
 $\frac{3x}{x} = 3$
 $5x^2(x-2)$
 $0x^2(x-2)$
 $3(x-2)$
 RD

Answer = $5x^2 + 3$

$$5x^3 - 10x^2 + 3x - 6 = (x-2)(5x^2 + 3)$$

Partner Practice:

$(x^3 + 5x^2 + 12x + 12) / (x + 2)$

Long Division with a remainder

$(x^2 + 10x + 18) / (x + 5)$

$$\begin{array}{r} x + 5 \overline{) x^2 + 10x + 18} \\ \underline{-x^2 + 5x} \\ 5x + 18 \\ \underline{-5x + 25} \\ R -7 \end{array}$$

1. $\frac{x^2}{x} = x$
 2. $x(x+5)$
 1. $\frac{5x}{x} = 5$
 2. $5(x+5)$

Answer $x + 5 \frac{-7}{x+5}$

Long Division with a remainder

$(2x^3 + 4x^2 + 8x - 5) / (x + 3)$

$$\begin{array}{r} 2x^2 - 2x + 14 \\ x + 3 \overline{) 2x^3 + 4x^2 + 8x - 5} \\ \underline{-2x^3 + 6x^2} \\ -2x^2 + 8x \\ \underline{+2x^2 + 6x} \\ 14x - 5 \\ \underline{-14x + 42} \\ -47 \end{array}$$

1. $\frac{2x^3}{x} = 2x^2$
 2. $2x^2(x+3)$
 1. $\frac{-2x^2}{x} = -2x$
 2. $-2x(x+3)$
 1. $\frac{14x}{x} = 14$
 2. $14(x+3)$

Answer: $2x^2 - 2x + 14 \frac{-47}{x+3}$

Partner Practice:

$(x^3 + 5x^2 + 12x + 10) / (x + 2)$

