

**Bell Work:**

1. Add  $(6a^2 + 8a^3 + 5a) + (-4a^3 - 9a + 7a^2)$ .
2. Multiply  $4b^2(2b^3 - 7b^2 + 6)$ .
3. What is the quadratic formula?
4. What is the 4<sup>th</sup> term of  $(2x - 3)^7$ ?

1.  $(x^3 + 8x^2 + 7x - 10) \div (x + 2)$     *Write in long division.*

$$x + 2 \overline{) x^3 + 8x^2 + 7x - 10}$$

1.  $(x^3 + 8x^2 + 7x - 10) \div (x + 2)$

$$\begin{array}{r} x^2 \\ \underline{x + 2} \overline{) \underline{x^3 + 8x^2 + 7x - 10}} \end{array}$$

*What times  $x = x^3$  ?*

$x^2$

1.  $(x^3 + 8x^2 + 7x - 10) \div (x + 2)$

$$\begin{array}{r}
 x^2 \\
 \hline
 x + 2 \overline{) x^3 + 8x^2 + 7x - 10} \\
 \underline{x^3 + 2x^2} \phantom{+ 7x - 10} \\
 \phantom{x^3 + } 6x^2 + 7x - 10
 \end{array}$$

*Multiply. (Top x Front)*

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

1.  $(x^3 + 8x^2 + 7x - 10) \div (x + 2)$

$$\begin{array}{r} x^2 \\ x + 2 \overline{) x^3 + 8x^2 + 7x - 10} \\ \underline{- x^3 + 2x^2} \phantom{+ 7x - 10} \\ 6x^2 \phantom{+ 7x - 10} \end{array}$$

*Subtract or change signs and add.*

1.  $(x^3 + 8x^2 + 7x - 10) \div (x + 2)$

$$\begin{array}{r}
 x^2 \\
 \hline
 x + 2 \overline{) x^3 + 8x^2 + 7x - 10} \\
 \underline{- x^3 + 2x^2} \phantom{+ 7x - 10} \\
 6x^2 + 7x \phantom{- 10}
 \end{array}$$

*Bring down the next term.*

$$1. (x^3 + 8x^2 + 7x - 10) \div (x + 2)$$

$$\begin{array}{r}
 \phantom{x + 2} x^2 + 6x \\
 \hline
 x + 2 \overline{) x^3 + 8x^2 + 7x - 10} \\
 - \phantom{x + 2} x^3 + 2x^2 \\
 \hline
 \phantom{x + 2} 6x^2 + 7x
 \end{array}$$

*What times  $x = 6x^2$  ?*

*$6x$*

$$1. (x^3 + 8x^2 + 7x - 10) \div (x + 2)$$

$$\begin{array}{r} x^2 + 6x \\ x + 2 \overline{) x^3 + 8x^2 + 7x - 10} \\ \underline{- x^3 + 2x^2} \phantom{- 10} \\ 6x^2 + 7x \phantom{- 10} \\ \underline{6x^2 + 12x} \phantom{- 10} \\ \phantom{6x^2 + } 7x - 10 \end{array}$$

*Multiply. (Top x Front)*

$$6x(x + 2) = x^2 + 12x$$



$$1. (x^3 + 8x^2 + 7x - 10) \div (x + 2)$$

$$\begin{array}{r} x^2 + 6x \\ x + 2 \overline{) x^3 + 8x^2 + 7x - 10} \\ \underline{- x^3 + 2x^2} \phantom{- 10} \\ 6x^2 + 7x \phantom{- 10} \\ \underline{- 6x^2 + 12x} \phantom{- 10} \\ -5x \phantom{- 10} \end{array}$$

*Subtract or change signs and add.*

$$1. (x^3 + 8x^2 + 7x - 10) \div (x + 2)$$

$$\begin{array}{r} x^2 + 6x \\ x + 2 \overline{) x^3 + 8x^2 + 7x - 10} \\ \underline{- x^3 + 2x^2} \phantom{- 10} \\ 6x^2 + 7x \phantom{- 10} \\ \underline{- 6x^2 + 12x} \phantom{- 10} \\ -5x - 10 \end{array}$$

*Bring down the next term.*

1.  $(x^3 + 8x^2 + 7x - 10) \div (x + 2)$

$$\begin{array}{r} \phantom{x+2}x^2 + 6x - 5 \\ x+2 \overline{) x^3 + 8x^2 + 7x - 10} \\ \underline{- x^3 + 2x^2} \phantom{- 10} \\ \phantom{x+2}6x^2 + 7x \\ \underline{- 6x^2 + 12x} \phantom{- 10} \\ \phantom{x+2} \phantom{6x^2} - 5x - 10 \end{array}$$

What times  $x = -5x$  ?  
-5

1.  $(x^3 + 8x^2 + 7x - 10) \div (x + 2)$

$$\begin{array}{r} x^2 + 6x - 5 \\ x + 2 \overline{) x^3 + 8x^2 + 7x - 10} \\ \underline{- x^3 + 2x^2} \phantom{- 10} \\ 6x^2 + 7x \phantom{- 10} \\ \underline{- 6x^2 + 12x} \phantom{- 10} \\ -5x - 10 \\ \underline{- 5x - 10} \phantom{- 10} \end{array}$$

*Multiply. (Top x Front)*

$$-5(x + 2) = -5x - 10$$

1.  $(x^3 + 8x^2 + 7x - 10) \div (x + 2)$

$x^2 + 6x - 5$  ← Answer.

$$\begin{array}{r} x + 2 \overline{) x^3 + 8x^2 + 7x - 10} \\ \underline{- x^3 + 2x^2} \end{array}$$

$$\begin{array}{r} 6x^2 + 7x \\ \underline{- 6x^2 + 12x} \end{array}$$

$$\begin{array}{r} - 5x - 10 \end{array}$$

$$\begin{array}{r} \underline{+ 5x + 10} \end{array}$$

$$0$$

*Change signs and add or subtract.*

3.  $(3x^3 + 11x^2 - 19x + 7) \div (x + 5)$

$$x + 5 \overline{) 3x^3 + 11x^2 - 19x + 7}$$

*Write in long division.*

$$3. (3x^3 + 11x^2 - 19x + 7) \div (x + 5)$$

$$3x^2$$

$$x + 5 \overline{) 3x^3 + 11x^2 - 19x + 7}$$

*What times  $x = 3x^3$  ?*  
 $3x^2$

$$3. (3x^3 + 11x^2 - 19x + 7) \div (x + 5)$$

$$\begin{array}{r} 3x^2 \\ x + 5 \overline{) 3x^3 + 11x^2 - 19x + 7} \\ \underline{2x^3 + 15x^2} \end{array}$$

*Multiply. (Top x Front)*

$$5x^2(x + 5) = 2x^3 + 15x^2$$



$$3. (3x^3 + 11x^2 - 19x + 7) \div (x + 5)$$

$$\begin{array}{r} 3x^2 \\ x + 5 \overline{) 3x^3 + 11x^2 - 19x + 7} \\ \underline{- 2x^3 + 15x^2} \phantom{- 19x + 7} \\ -4x^2 \phantom{- 19x + 7} \end{array}$$

*Subtract or change signs and add.*

$$3. (3x^3 + 11x^2 - 19x + 7) \div (x + 5)$$

$$\begin{array}{r} 3x^2 \\ x + 5 \overline{) 3x^3 + 11x^2 - 19x + 7} \\ \underline{- 2x^3 + 15x^2} \phantom{- 19x + 7} \\ -4x^2 - 19x \phantom{+ 7} \end{array} \quad \textit{Bring down the next term.}$$

3.  $(3x^3 + 11x^2 - 19x + 7) \div (x + 5)$

$$\begin{array}{r}
 3x^2 - 4x \\
 \hline
 x + 5 \overline{) 3x^3 + 11x^2 - 19x + 7} \\
 \underline{- 2x^3 + 15x^2} \phantom{- 19x + 7} \\
 -4x^2 - 19x \phantom{+ 7}
 \end{array}$$

*What times  $x = -4x^2$  ?*

*$-4x$*

3.  $(3x^3 + 11x^2 - 19x + 7) \div (x + 5)$

$$\begin{array}{r}
 3x^2 - 4x \\
 \hline
 x + 5 \overline{) 3x^3 + 11x^2 - 19x + 7} \\
 \underline{- 2x^3 + 15x^2} \phantom{- 19x + 7} \\
 -4x^2 - 19x \phantom{+ 7} \\
 \underline{- 4x^2 - 20x} \phantom{+ 7} \\
 \phantom{- 4x^2 - 20x} 7
 \end{array}$$

*Multiply. (Top x Front)*

$$-4x(x + 5) = -4x^2 - 20x$$

3.  $(3x^3 + 11x^2 - 19x + 7) \div (x + 5)$

$$\begin{array}{r}
 3x^2 - 4x \\
 \hline
 x + 5 \overline{) 3x^3 + 11x^2 - 19x + 7} \\
 \underline{- 2x^3 + 15x^2} \phantom{+ 7} \\
 -4x^2 - 19x \phantom{+ 7} \\
 \underline{+ 4x^2 + 20x} \phantom{+ 7} \\
 x \phantom{+ 7}
 \end{array}$$

*Subtract or change signs and add.*

3.  $(3x^3 + 11x^2 - 19x + 7) \div (x + 5)$

$$\begin{array}{r}
 3x^2 - 4x \\
 \hline
 x + 5 \overline{) 3x^3 + 11x^2 - 19x + 7} \\
 \underline{- 2x^3 + 15x^2} \phantom{- 19x + 7} \\
 - 4x^2 - 19x \phantom{+ 7} \\
 \underline{+ 4x^2 + 20x} \phantom{+ 7} \\
 x + 7
 \end{array}$$

*Bring down the next term.*

3.  $(3x^3 + 11x^2 - 19x + 7) \div (x + 5)$

$$\begin{array}{r}
 3x^2 - 4x + 1 \\
 \hline
 x + 5 \overline{) 3x^3 + 11x^2 - 19x + 7} \\
 \underline{- 2x^3 + 15x^2} \phantom{- 19x + 7} \\
 - 4x^2 - 19x \phantom{+ 7} \\
 \underline{+ 4x^2 + 20x} \phantom{+ 7} \\
 x + 7 \\
 \underline{x + 5} \\
 \phantom{x + 7} 2
 \end{array}$$

*Multiply. (Top x Front)*

$$1(x + 5) = x + 5$$

3.  $(3x^3 + 11x^2 - 19x + 7) \div (x + 5)$

$$3x^2 - 4x + 1 + \frac{2}{x + 5}$$

$$\begin{array}{r}
 x + 5 \overline{) 3x^3 + 11x^2 - 19x + 7} \\
 \underline{- 2x^3 + 15x^2} \phantom{- 19x + 7} \\
 - 4x^2 - 19x \phantom{+ 7} \\
 \underline{+ 4x^2 + 20x} \phantom{+ 7} \\
 x + 7 \\
 \underline{- x + 5} \\
 2
 \end{array}$$

*The numerator will be the remainder and the denominator will be the divisor.*

*Subtract or change signs and add.*

*A remainder will tell us if the answer will have a fraction. This one does.*



6.  $(6x^4 + 7x^3 + 11x - 6) \div (3x - 1)$

$$\begin{array}{r}
 2x^3 + 3x^2 + x + 4 \\
 3x - 1 \overline{) 6x^4 + 7x^3 + 0x^2 + 11x - 6} \\
 \underline{-6x^4 + 2x^3} \phantom{+ 0x^2 + 11x - 6} \\
 9x^3 + 0x^2 + 11x - 6 \\
 \underline{-9x^3 + 3x^2} \phantom{+ 11x - 6} \\
 3x^2 + 11x - 6 \\
 \underline{-3x^2 + x} \phantom{- 6} \\
 12x - 6 \\
 \underline{-12x + 4} \\
 -2
 \end{array}$$

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

*Write the remainder as a fraction.*

*Use  $0x^2$  as a place holder. If the polynomial is missing a term, use 0 as a place holder.*

**Assignment:**

**Dividing Polynomials Worksheet**