

Name: \_\_\_\_\_

Date: \_\_\_\_\_

PC: Synthetic Division When the Divisor is Not Linear ( $a = 1$ )

Ms. Loughran

1. Divide  $2x^3 + 3x^2 - x + 16$  by  $x^2 + 2x - 3$

$$\begin{array}{r|rrrr} & 2 & 3 & -1 & 16 \\ -2 & & -4 & 2 & \\ 3 & & & 6 & -3 \\ \hline & 2 & -1 & 7 & 13 \end{array}$$

$$2x - 1 + \frac{7x + 13}{x^2 + 2x - 3}$$

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

$$\begin{array}{r|rrrr} & 1 & -1 & -1 & 10 \\ 3 & & 3 & 6 & \\ -5 & & & -5 & -10 \\ \hline & 1 & 2 & 0 & 0 \end{array}$$

$$x + 2$$

3. Divide  $3x^3 + 4x^2 - 13x + 6$  by  $x^2 + 2x - 3$

$$\begin{array}{r|rrrr} & 3 & 4 & -13 & 6 \\ -2 & & -6 & 4 & \\ 3 & & & 9 & -6 \\ \hline & 3 & -2 & 0 & 0 \end{array}$$

$$3x - 2$$

Name: \_\_\_\_\_  
 PC: Long and Synthetic Division Practice

Date: \_\_\_\_\_  
 Ms. Loughran

For 1-7, use synthetic division to divide the polynomials.

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

$$\begin{array}{r|rrrr} -2 & 1 & -5 & 4 & -2 \\ & & -2 & 14 & -36 \\ \hline & 1 & -7 & 18 & -38 \end{array}$$

4.  $\frac{4a^2 + 4a - 12}{2a - 1}$

$$2a + 3 - \frac{9}{2a - 1}$$

7.  $\frac{2x^3 - x^2 - 5}{2x - 5}$

$$\begin{array}{r|rrrr} \frac{1}{2} & 2 & -1 & 0 & -5 \\ & & 5 & 10 & 25 \\ \hline & 2 & 4 & 10 & 20 \\ & & & & \div 2 \end{array}$$

$$2x^2 + 2x + 5 + \frac{20}{2x - 5}$$

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

$$\begin{array}{r|rrrr} 2 & 1 & -5 & 4 & -2 \\ & & 2 & -6 & -4 \\ \hline & 1 & -3 & -2 & -6 \end{array}$$

5.  $\frac{6a^2 - 5a + 10}{3a + 2}$

$$\begin{array}{r|rrr} \frac{-2}{3} & 6 & -5 & 10 \\ & & -4 & 6 \\ \hline & 6 & -9 & 16 \\ & & & \div 3 \end{array}$$

$$2a - 3 + \frac{16}{3a + 2}$$

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

$$\begin{array}{r|rrrrr} -2 & -4 & 2 & -1 & 1 \\ & & 8 & -20 & 42 \\ \hline & -4 & 10 & -21 & 43 \end{array}$$

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

$$\begin{array}{r|rrrr} -2 & 2 & 0 & -2 & 1 \\ & & -4 & 8 & -2 \\ \hline & 2 & -4 & 6 & -1 \\ & & & & \div 2 \end{array}$$

$$x^2 - 2x + 3 - \frac{11}{2x + 4}$$

For 8-10, use long division to divide the polynomials.

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

$$\begin{array}{r} 2x^2 - 5x + 8 \\ x^2 + 2x + 1 \overline{) 2x^4 - x^3 - 2x + 5} \\ \underline{2x^4 + 4x^3 + 2x^2} \phantom{+ 5} \\ -5x^3 - 2x^2 - 2x + 5 \\ \underline{-5x^3 - 10x^2 - 5x} \phantom{+ 5} \\ 8x^2 + 3x + 5 \\ \underline{8x^2 + 16x + 8} \\ -13x - 3 \end{array}$$

$$2x^2 - 5x + 8 - \frac{13x + 3}{x^2 + 2x + 1}$$

9.  $\frac{2x^4 - 3x^2 + 7x - 8}{x^2 + x - 3}$

$$\begin{array}{r} 2x^2 - 2x + 5 \\ x^2 + x - 3 \overline{) 2x^4 - 3x^2 + 7x - 8} \\ \underline{2x^4 + 2x^3 - 6x^2} \phantom{+ 7x - 8} \\ -2x^3 + 3x^2 + 7x - 8 \\ \underline{-2x^3 - 2x^2 + 6x} \phantom{- 8} \\ 5x^2 + x - 8 \\ \underline{5x^2 + 5x - 15} \\ -4x + 7 \end{array}$$

$$2x^2 - 2x + 5 - \frac{4x - 7}{x^2 + x - 3}$$

10.  $\frac{x^3 + 4ax^2 + 4a^2x + a^3}{2a + x}$

$$\begin{array}{r} x^2 + 2ax \\ x + 2a \overline{) x^3 + 4ax^2 + 4a^2x + a^3} \\ \underline{x^3 + 2ax^2} \phantom{+ a^3} \\ 2ax^2 + 4a^2x + a^3 \\ \underline{2ax^2 + 4a^2x} \phantom{+ a^3} \\ a^3 \end{array}$$

$$x^2 + 2ax + \frac{a^3}{x + 2a}$$