

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

Hour: \_\_\_\_\_

**KEY**Compare your answer in (a) to your remainder in (b). **Show all work.**1. Consider the following polynomial function:  $f(x) = 3x^2 - 5x + 10$ a. Find  $f(4)$ 

$$= 38$$

b. Use synthetic division to divide  $f(x)$  by  $(x - 4)$ 

$$\begin{array}{r|rrr} 4 & 3 & -5 & 10 \\ & \downarrow & 12 & 28 \\ \hline & 3 & 7 & 30 \end{array}$$

$$(3x - 7) + \frac{30}{x-4}$$

2. Consider the following polynomial function:  $g(x) = x^3 - 5x^2 - 7x + 1$ a. Find  $g(-2)$ 

$$= -13$$

b. Use synthetic division to divide  $g(x)$  by  $(x + 2)$ 

$$\begin{array}{r|rrrr} -2 & 1 & -5 & -7 & 1 \\ & \downarrow & -2 & 14 & -14 \\ \hline & 1 & -7 & 7 & -13 \end{array}$$

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

3. Consider the following polynomial function:  $h(x) = 2x^4 - 6x^3 + 15x^2 + 9x - 3$ a. Find  $h(3)$ 

$$= 159$$

b. Use synthetic division to divide  $h(x)$  by  $(x - 3)$ 

$$\begin{array}{r|rrrrr} 3 & 2 & -6 & 15 & 9 & -3 \\ & \downarrow & 6 & 0 & 45 & 162 \\ \hline & 2 & 0 & 15 & 54 & 159 \end{array}$$

$$2x^3 + 15x + 54 + \frac{159}{x-3}$$

4. Consider the following polynomial function:  $k(x) = 2x^6 - x^5 + x^3 - 5x^2 + x + 7$ a. Find  $k(2)$ 

$$= 93$$

b. Use synthetic division to divide  $k(x)$  by  $(x - 2)$ 

$$\begin{array}{r|rrrrrrr} 2 & 2 & -1 & 0 & 1 & -5 & 1 & 7 \\ & \downarrow & 4 & 6 & 12 & 26 & 42 & 86 \\ \hline & 2 & 3 & 6 & 13 & 21 & 43 & 93 \end{array}$$

$$2x^5 + 3x^4 + 6x^3 + 13x^2 + 21x + 43 + \frac{93}{x-2}$$