

NAME: \_\_\_\_\_

**DO NOT** write your answers here. Do it in other sheets and **show all your work**.

**STAPLE this sheet to your other sheets.**

1. Divide using long division. State the quotient  $q(x)$  and the remainder  $r$ . Then write the solution in two different ways:

1. As  $D = dq + r$ .

2. As  $\frac{D}{d} = q + \frac{r}{d}$ .

[Where  $D$  is the dividend (the polynomial that is being divided; in other words, the numerator) and  $d$  is the divisor (the polynomial that divides; in other words, the denominator).]

a)  $\frac{x^3 - 2x^2 - 5x + 6}{x + 2}$

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

c)  $\frac{-2x^3 - 7x^2 + x - 2}{x^2 - x + 2}$

d)  $\frac{x^7 - 1}{x - 1}$

2. Divide using synthetic division. State the quotient  $q$  and the remainder  $r$ . Then write the solution in two different ways:

1. As  $D = dq + r$ .

2. As  $\frac{D}{d} = q + \frac{r}{d}$ .

[Where  $D$  is the dividend (the polynomial that is being divided; in other words, the numerator) and  $d$  is the divisor (the polynomial that divides; in other words, the denominator).]

a)  $\frac{x^3 - 2x^2 - 5x + 6}{x - 3}$

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

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

d)  $\frac{x^7 - 1}{x - 1}$