**4.4 Dividing Polynomials ⸱ Form A (All work on separate sheet of paper. Final answers on this WS for full credit.)**

**Examples 1**

**Simplify each expression.**

 **1.** $(4f^{5}-6f^{4}+12f^{3}-8f^{2})(4f^{2})^{–1}$ **2.** (4$a^{2}h^{2} $– 8$a^{3}$*h* + 3$a^{4}$) ÷ (2$a^{2}$)

**Examples 2 and 4**

**Simplify by using long division.**

 **3.** (*d*2 + 4*d* + 3)(*d* + 1) –1  **4.** (6*y*2 + *y* – 2)(2*y* – 1)–1  **5.** (2*x*2 – 5*x* – 4) ÷ (*x* – 3)

**Examples 4 and 5**

**Simplify using synthetic division.**

 **6.** (3$t^{4}$ + 4$t^{3} $– 32$t^{2} $– 5*t* – 20)(*t* + 4)–1 **7.** $\frac{2x^{3}- x^{2}- 18x+ 32 }{2x – 6}$ **8.** (3*c*4 + 6*c*3$ $– 2*c* + 4)(*c* + 2)–1

**Mixed Exercises**

**Simplify.**

 **9.** (*a*3 – 6*a*2 + 10*a* – 3) ÷ (*a* – 3) **10.** (*x*3 + 2*x*2 – 34*x* + 9) ÷ (*x* + 7)

**11.** (6*x*3 + *x*2 + *x*) ÷ (2*x* + 1) **12.** (*x*4 – *y*4) ÷ (*x* – *y*)

**13. (***a*3*b*2 – *a*2*b* + 2*b)*(-*ab*)-1 **14.** $\frac{p^{3} + 2p^{2} - 7p - 21}{p + 3}$

**15. AVERAGES** Bena has a list of *n* + 1 numbers and she needs to find their average. Two of the numbers are *n*3 and 2. Each of the other *n* – 1 numbers are all equal to 1. Find the average of these numbers.

**16. REASONING** Rewrite $\frac{6x^{4} - 2x^{3} - 16x^{2} + 24x + 2}{2x + 4}$ as *q*(*x*) + $\frac{r(x)}{d(x)}$ using long division. What does the remainder indicate in this problem?

**17. REGULARITY** Rewrite $\frac{x^{5} + 2x^{2} + x - 2}{2x + 3}$ as *q*(*x*) + $\frac{r(x)}{d(x)}$ using long division.

 **a.** Identify *q*(*x*), *r*(*x*), and *g*(*x*).

 **b.** How can you check your work using the expressions of *q*(*x*), *g*(*x*), and *r*(*x*)?

**18. USE A MODEL** Luciano has a square garden. A new

 garden will have the same width and a length that is

 3 feet more than twice the width of the original

 garden.

 **a.** Define a variable and label each side of the diagrams with an expression for its length.

 **b.** Write a ratio to represent the percent increase in the area of the garden. Use polynomial division to simplify the expression.

 **c.** Use your expression from part b to determine the percent of increase in area if the original garden was a 12-foot square. Check your answer.

**19. PERSEVERE** If a polynomial is divided by a binomial and the remainder is 0, what does this tell you about the relationship between the binomial and the polynomial?

**20. CREATE** Write a quotient of two polynomials for which the remainder is 3.

**21. PERSEVERE** Mr. Collins has his class working with bases and polynomials. He wrote on the board that the number 1111 in base *B* has the value *B*3 + *B*2 + *B* + 1. The class was then given the following questions to answer.

 **a.** The number 11 in base *B* has the value *B* + 1. What is 1111 (in base *B*) divided by
11 (in base *B*)?

 **b.** The number 111 in base *B* has the value *B*2 + *B* + 1. What is 1111 (in base *B*) divided by
111 (in base *B*)?