Name _____ Date _____ Class _____

LESSON 6-5

Dividing Polynomials

Practice and Problem Solving: A/B

Divide by using long division.

1. $(x^2 - x - 6) \div (x - 3)$

2. $(2x^3 - 10x^2 + x - 5) \div (x - 5)$

3. $(-3x^2 + 20x - 12) \div (x - 6)$

4. $(3x^3 + 9x^2 - 14) \div (x + 3)$

Divide by using synthetic division.

5. $(3x^2 - 8x + 4) \div (x - 2)$

6. $(5x^2 - 4x + 12) \div (x + 3)$

7. $(9x^2 - 7x + 3) \div (x - 1)$

8. $(-6x^2 + 5x - 10) \div (x + 7)$

Use synthetic substitution to evaluate *P*(*x*) for the given value.

9. $P(x) = 4x^2 - 9x + 2$ for $x = 3$

10. $P(x) = -3x^2 + 10x - 4$ for $x = -2$

Determine whether the given binomial is a factor of *P*(*x*).

11. $(x - 4)$; $P(x) = x^2 + 8x - 48$

12. $(x + 5)$; $P(x) = 2x^2 - 6x - 1$

Solve.

13. The total number of dollars donated each year to a small charitable organization has followed the trend $d(t) = 2t^3 + 10t^2 + 2000t + 10{,}000$, where d is dollars and t is the number of years since 1990. The total number of donors each year has followed the trend $p(t) = t^2 + 1000$. Write an expression describing the average number of dollars per donor.

Practice and Problem Solving: Modified

1. $3y^2$
2. $2p$
3. 12
4. $7xy^2$
5. x, 7
6. 2; m^3
7. 2; y^5 ; 10
8. $4y^2(2+9y)$
9. $7t(-2t^4+1)$
10. $5x^2(2x^2+5x+1)$
11. $(x+3)(5x+8)$
12. $(15+3x)(x-2)$
13. $(7a^2-3)(a+3)$
14. $(4r^2+3)(5r+7)$
15. $(3n+5)^2$
16. $(2a^2-5)^2$
17. $(m+4)(m^2-4m+16)$
18. $(5x-1)(25x^2+5x+1)$

Reading Strategies

1. Multiply $(x + 3)$ and $(x^2 + 2)$.
2. No; there are no two factors that have $x^2 + 2$ as their product.
3. 5
4. a. $(x^3 - 8x^2) + (-x + 8)$
   b. x^2 and -1
   c. $x^2(x - 8) - 1(x - 8) = (x - 8)(x^2 - 1)$
   d. $x^2 - 1$; $(x + 1)(x - 1)$
   e. $(x - 8)(x + 1)(x - 1)$

Success for English Learners

1. I would use the formulas for the sum or difference of two cubes:
   $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$
   $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$
2. It is the greatest monomial that can divide every term in a polynomial.

LESSON 6-5

Practice and Problem Solving: A/B

1. $x+2$
2. $2x^2+1$
3. $-3x+2$
4. $3x^2-\frac{14}{x+3}$
5. $3x-2$
6. $5x-19+\frac{69}{x+3}$
7. $9x+2+\frac{5}{x-1}$
8. $-6x+47+\frac{339}{x+7}$
9. $P(3)=11$
10. $P(-2)=-36$
11. Yes
12. No
13. $2t+10$

Practice and Problem Solving: C

1. $x^2+5x-12$
2. $x^2+15x+45+\frac{131}{x-3}$
3. $4x^3+9x^2+5+\frac{9}{3x-1}$
4. $-x^2+6x-7$
5. $9x+51-\frac{317}{x-6}$
6. $3x^3-6x^2+10x-20+\frac{41}{x+2}$
7. $6x^4+6x^3+6x^2+3x+4+\frac{2}{x-1}$
8. $-x^3-10x^2-24x-70-\frac{217}{x-3}$
9. $P(5)=438$
10. $P(-2)=-79$