NAME _____ DATE _____

5–3 Monomial Factors of Polynomials

Objective: To divide polynomials by monomials and to find monomial factors of polynomials.

Vocabulary

Divisible One polynomial is (evenly) divisible by another polynomial if the quotient is also a polynomial. Example 1b shows that $27uv - 36v$ is divisible by $9v$.

Greatest monomial factor of a polynomial The GCF of the terms of the polynomial. In Example 3, the GCF of $3x^2 + 12x$ is $3x$.

Example 1 Divide: **a.** $\dfrac{6m + 36}{6}$ **b.** $\dfrac{27uv - 36v}{9v}$

Solution Divide each term of the polynomial by the monomial. Then add the results.

a. $\dfrac{6m + 36}{6} = \dfrac{6m}{6} + \dfrac{36}{6}$

$= m + 6$

b. $\dfrac{27uv - 36v}{9v} = \dfrac{27uv}{9v} - \dfrac{36v}{9v}$

$= 3u - 4$

Example 2 Divide: $\dfrac{2x^4 - 8x^3y + 4x^2y^2}{-2x^2}$

Solution $\dfrac{2x^4 - 8x^3y + 4x^2y^2}{-2x^2} = \dfrac{2x^4}{-2x^2} - \dfrac{8x^3y}{-2x^2} + \dfrac{4x^2y^2}{-2x^2} = -x^2 + 4xy - 2y^2$

Divide. Assume that no denominator equals zero.

1. $\dfrac{4a + 12}{4}$
2. $\dfrac{10a - 15}{5}$
3. $\dfrac{20n - 16}{4}$
4. $\dfrac{6x + 9y + 12}{3}$
5. $\dfrac{2m - 4n + 6}{2}$
6. $\dfrac{x^3 - 4x^2 + 6x}{x}$
7. $\dfrac{8xy - 12x^2}{4x}$
8. $\dfrac{5a - 10a^2 - 15a^3}{5a}$
9. $\dfrac{12y - 18y^2 - 6y^3}{6y}$
10. $\dfrac{4x^2 - 12x - 8}{4}$
11. $\dfrac{27y^4 + 18y^3 - 36y^2}{9y^2}$
12. $\dfrac{6u^3 + 4u^2 - 2u}{2u}$
13. $\dfrac{12r^4 - 9r^3 - 6r^2}{-3r^2}$
14. $\dfrac{5m^3 + 8m^4 - 3m^5}{-m^3}$
15. $\dfrac{xy^3 + x^3y}{xy}$
16. $\dfrac{8ab^2 - 12a^2b}{4ab}$