NAME _____ DATE _____

**Module 12** Simplifying Algebraic Expressions by Factoring Polynomials
**Lesson 2** Factoring by Grouping


**Factor.**

**1.** $d(d - 2) + 5(d - 2)$

**2.** $m(m^2 + 3) - 2(m^2 + 3)$

**3.** $(x + 5) + x(x + 5)$

**4.** $c(2c - d) - d(2c - d)$

**5.** $a(b + c) + d(b + c)$

**6.** $x(y^2 - z) - 5(y^2 - z)$

**7.** $y(y - 4) + 3(4 - y)$

**8.** $m(m - 7) - 2(7 - m)$

**9.** $a^2 + 5a + 2ac + 10c$

**10.** $v^2 + 5v + uv + 5u$

**11.** $16r + 2rs - 3s - 24$

**12.** $2m - 3 + 6mn - 9n$

**13.** $y^2 - 3y + 3y - 9$

**14.** $a^2 + ab + ab + b^2$

**15.** $3c^2 + 18c - 5cd - 30d$

**16.** $g^2 - gh - gh + h^2$

**17.** $10p^3 - 20p^2 + p - 2$

**18.** $6v^3 + 9v^2 + 4v + 6$

**19.** $3x^3 - 10 - 6x^2 + 5x$

**20.** $-4g^3 + 15 - 6g^2 + 10g$

**21.** $16mn - 12n + 20m - 15$

**22.** $3x^2 - 4xy - 15x + 20y$

**23.** $6a^2 + 24ab + 3a + 12b$

**24.** $6m^2 - 15mn - 14mn + 35n^2$

## Journal

1. Explain how to factor the polynomial $6a + 3 + 2a^2 + a$.
2. Lisa and Timothy are factoring the polynomial $10a^2 - 6ab + 35a - 21b$. Lisa wants to factor the polynomial by grouping the first two terms and then, grouping the last two terms. Timothy wants to factor by grouping the first and third terms together and by grouping the second and fourth terms together. Show them that they will both get the same result.
3. Explain, using properties of real numbers, why Lisa and Timothy both arrived at the same answer.
4. Is it possible to factor $2x^3 + 2x^2y - 3x^2 + 3xy$ by grouping? Explain your answer.
5. Explain how to factor the polynomial $3(x - 2) + x(2 - x)$.

## Cumulative Review

**Simplify.**

**1.** $(x - 2)(x^2 + 3x + 4)$

**2.** $(d - 3)(d^2 - d + 1)$

**3.** $(m + 4)(m^2 - 2m + 6)$

**4.** $(q + 2)(q^2 + 3q - 1)$

**5.** $(x^2 + 5x + 6) \div (x + 2)$

**6.** $(y^2 - 8y - 33) \div (y - 11)$

**7.** $(w^2 - 25) \div (w + 5)$

**8.** $(t^3 + 64) \div (t + 4)$

**Factor, if possible.**

**9.** $14x^2y + 21xy^3 - 35y^2$

**10.** $a^3b^4 - a^2b^5 + a^4b^2c^2$