

## Factoring

### Greatest Common Monomial Factor

Examples: Factor out the greatest common factor from all terms.

1.  $24x^2 - 8x$

2.  $2x^2 + 8x$

3.  $12x^2 - 9x + 15$

4.  $13m + 26m^2 - 39m^3$

5.  $18m^2n^4 - 12m^2n^3 + 24m^2n^2$

### Special Factoring: Difference of Two Squares

Examples: Factor into two binomials.

6.  $x^2 - 9$

7.  $x^2 - 25$

8.  $4x^2 - 25$

9.  $a^2 - x^2$

10.  $x^2 - 16y^2$

11.  $16x^4 - y^2$

### Factoring Trinomials: $x^2 + bx + c$

Examples: Factor into two binomials.

12.  $x^2 + 5x + 6$

13.  $x^2 - 10x + 16$

14.  $x^2 + 7x - 18$

15.  $x^2 - 16x + 64$

16.  $a^2 - 10a + 25$

17.  $b^2 + 2b + 1$

**Factoring Trinomials:  $ax^2 + bx + c$**

Examples: Factor into two binomials.

18.  $3x^2 + 10x - 8$

19.  $7a^2 - 11a + 4$

20.  $4y^2 + 8y + 3$

21.  $6x^2 - 7x - 20$

22.  $5n^2 + 2n + 7$

**Factoring: Putting It All Together**

Examples: Factor.

23.  $2x^2 - 8$

24.  $6x^2 - 26x - 20$

25.  $4x^2 + 16x + 16$

26.  $2x^3 + 12x^2 + 18x$

27.  $4x^4 - 4x^2$

**Special Factoring: Sum and Difference of Perfect Cubes**

Sums and Differences of Cubes always factor into a \_\_\_\_\_ and a \_\_\_\_\_.

Examples: Use SOPPS ( \_\_\_\_\_ ) to factor.

28.  $x^3 + 8$

29.  $x^3 - 125$

30.  $a^3 - b^3$

31.  $8x^3 + 1$

32.  $27x^3 + 8y^3$

**Special Factoring: Factoring by Grouping**

Examples: Factor by dividing into groups and factoring each group.

33.  $x^3 + x^2 + 2x + 2$

34.  $12a^3 - 9a^2 + 4a - 3$

35.  $2p^3 + 5p^2 + 6p + 15$

36.  $3n^3 - 4n^2 + 9n - 12$

37.  $12n^3 + 4n^2 + 3n + 1$

38.  $5n^3 - 10n^2 + 3n - 6$