

## 1.5B Simplifying Expressions

### A. Clearing Parentheses

We apply the distributive property.

**Example 1:** Simplify  $-3(2x + 5)$

**Solution**

$$-3(2x + 5) = -6x - 15$$

**Ans**  $\boxed{-6x - 15}$

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**Example 2:** Simplify  $-(x^2 - 5)$

**Solution**

$$-(x^2 - 5) = -x^2 + 5$$

**Ans**  $\boxed{-x^2 + 5}$

**Example 3:** Simplify  $\frac{2}{3}x^2(3x - 4y + 5)$

**Solution**

$$\frac{2}{3}x^2(3x - 4y + 5) = 2x^3 - \frac{8}{3}x^2y + \frac{10}{3}x^2$$

**Ans**  $\boxed{2x^3 - \frac{8}{3}x^2y + \frac{10}{3}x^2}$

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**Example 4:** Simplify  $-5ab^2(3 - 2a + 4b)$

**Solution**

$$-5ab^2(3 - 2a + 4b) = -15ab^2 + 10a^2b^2 - 20ab^3$$

**Ans**  $\boxed{-15ab^2 + 10a^2b^2 - 20ab^3}$

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## B. Simplifying

**Method:**

1. Clear parentheses
2. Collect like terms

**Example 1:** Simplify  $6x(y - 3) - (3yx - 4x + 2y)$

**Solution**

Clear parentheses:  $6xy - 18x - 3yx + 4x - 2y$

Alphabetize:  $6xy - 18x - 3xy + 4x - 2y$  (then combine . . .)

**Ans**  $\boxed{3xy - 14x - 2y}$

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**Example 2:** Simplify  $5x[xy - (-3x + 2yx) - 4(2y - 4x)]$

**Solution**

Clear parentheses (inner):  $5x[xy + 3x - 2yx - 8y + 16x]$

Clear parentheses (outer):  $5x^2y + 15x^2 - 10yx^2 - 40xy + 80x^2$

Alphabetize:  $5x^2y + 15x^2 - 10x^2y - 40xy + 80x^2$  (then combine . . .)

**Ans**  $\boxed{-5x^2y + 95x^2 - 40xy}$

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