

# Key Distributive Property & Factoring

When using the distributive property, BE CAREFUL whenever there are negatives involved. Remember to distribute the negative throughout the entire set of parentheses. Let's simplify these using the distributive property.

$$\begin{array}{l} \text{ } \swarrow \quad \searrow \\ -3(4x + 1) \\ -12x - 3 \end{array}$$

$$\begin{array}{l} \text{ } \swarrow \quad \searrow \\ -2(x - 5) \\ -2x + 10 \end{array}$$

Some students did the following problems. Let's check their work. If they are correct, give the students a happy face! If they are wrong, circle their mistake and write in the correct answer so they will not make the same mistake the next time.

$$1. \quad 3(x + 5) = 3x + 15 \text{ 😊}$$

$$2. \quad -2(x + 3) = -2x + 3 \text{ } ^{-6}$$

$$-2x - 6$$

$$3. \quad 5(x - 8) = 5x - 8 \text{ } -40$$

$$5x - 40$$

$$4. \quad -2(x - 5) = -2x + 10 \text{ 😊}$$

$$5. \quad -4x + 2(x + 3y) = -4x + 2x + 6y \text{ 😊}$$

$$6. \quad -2x - (y - 9) = -2x - y - 9 \text{ } ^{+9}$$

$$-2x - y + 9$$

Can you do the distributive property backwards? We call this "FACTORING". The trick is to find a factor that is common to each of the given terms.

Below is an example.

<p>Problem: Factor <math>5x + 5y</math>.</p> <p>Step One: Notice that the greatest common factor is 5. So, we place "5" outside the set of parentheses. ✓</p> <p>Step Two: Divide each term by 5 and place the result inside the set of parentheses. <math>\frac{5x}{5}</math> <math>\frac{5y}{5}</math></p> <p>Step Three: Use the distributive property to see if you are correct!</p>	<p><math>5( \quad + \quad )</math> ✓</p> <p><math>5(\underline{x} + \underline{y})</math> ✓</p> <p><math>5(x + y) = 5x + 5y</math> 😊</p>
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Let's try some more problems! Factor the algebraic expressions below!

- $3r + 3s$   $3(r + s)$
- $55a + 11$   $11(5a + 1)$
- $72t + 8$   $8(9t + 1)$
- $48j + 60k + 24$   $12(4j + 5k + 2)$
- $144q - 15$   $3(48q - 5)$
- $36z + 72$   $36(z + 2)$
- $3x + 15$   $3(x + 5)$
- $6m + 8n + 4$   $2(3m + 4n + 2)$
- $2x - 8$   $2(x - 4)$
- $40s + 100t$   $20(2s + 5t)$