

PART I GET STARTED**Today's Mathematics**

Write sums as products by factoring out a greatest common factor or a specified rational number.

Essential Question

How does factoring undo the distributive property?

DO NOW

Review the previous section. Show organized work.

1. $5(2x + 3)$

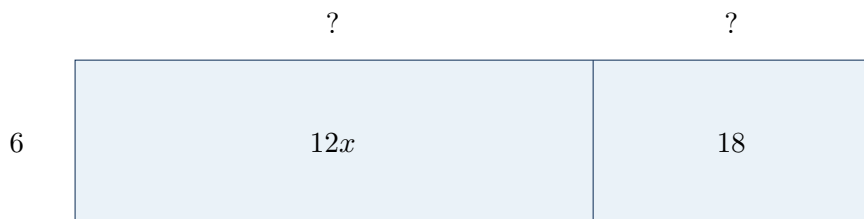
2. $-3(4a - 2)$

3. $\frac{1}{2}(6t + 10)$

4. List the positive factors common to 20 and 30.

SEE IT

A rectangle has height 6 units. Its two regions have areas $12x$ and 18 square units. Find each missing width and write the total area as a product.

**QUICK WRITE | 2 MINUTES**

How can you check whether $6(2x + 3)$ is a correct factorization of $12x + 18$?

PART II INVESTIGATE

CHOOSE THE COMMON FACTOR

Write $20x+30$ as a product in each row. Divide *both* terms by the chosen factor. Then distribute to check.

No.	Factor taken out	Remaining expression	Product
1	2		
2	5		
3	10		
4	-10		

THINK LIKE A MATHEMATICIAN

1. Which positive factor gives integer terms inside parentheses with no further common whole-number factor greater than 1? Why?

2. Why do both terms inside parentheses change sign when you factor out -10 instead of 10?

CREATE

Create a two-term expression whose greatest common factor is 7. Factor it completely, and verify by distributing.

PART III MAKE SENSE AND PRACTICE**WHAT WE CAN CONCLUDE**

Factoring writes a sum or difference as a product: $ab + ac = a(b + c)$.

To factor out the **greatest common factor (GCF)**, find the largest common factor of all terms. To factor out a specified number, divide every term by that number. A negative outside factor changes the signs inside. Check by distributing.

WORKED MODEL

$$\frac{3}{5}x + \frac{9}{5} = \frac{3}{5}(x + 3)$$

Factor out the coefficient $\frac{3}{5}$.

$$-12p + 18 = -6(2p - 3)$$

Factor out -6 .

TRY IT

1. Factor using the GCF: $28x - 42$.

2. Factor out the coefficient of t : $1.2t - 4.8$.

3. A rectangular mural is 8 feet high and has area $(24m + 40)$ square feet. Find its width and perimeter as simplified expressions. Include units.

MATH WRITE | 5 MINUTES

A student writes $-15y + 25 = -5(3y + 5)$. Explain the error. Correct the factorization and verify your correction by distributing.

PART IV PUZZLE PRACTICE

Homework

Name _____

Date _____

Simplify or factor as directed. Match each result to the answer bank. Write its letter in the matching numbered box to reveal a mathematical reminder.

1. GCF: $14x + 21$

2. GCF: $18x - 24$

3. Factor out $\frac{1}{2}$: $\frac{1}{2}x + \frac{5}{2}$.

4. Factor out -4 : $-8x + 12$.

5. Factor out 0.6 : $0.6x - 1.8$.

6. GCF: $25x + 10$

7. Factor out -3 : $9x - 6$.

8. GCF: $16x - 40$

9. Factor out $\frac{2}{3}$: $\frac{2}{3}x - 4$.

ANSWER BANK

U $8(2x - 5)$	C $\frac{1}{2}(x + 5)$	O $-3(-3x + 2)$
F $7(2x + 3)$	T $\frac{2}{3}(x - 6)$	R $5(5x + 2)$
A $6(3x - 4)$	O $0.6(x - 3)$	T $-4(2x - 3)$

1	2	3	4	5	6	7	8	9