



UNDERSTAND

- Use Structure** What term and $12x^2y$ have a GCF of $4xy$? Write an expression that shows the monomial factored out of the polynomial.
- Look for Relationships** Write a trinomial that has a GCF of $4x^2$.
- Error Analysis** Describe and correct the error a student made when factoring $10a^3b - 5a^2b^2 - 15ab$.

$$\begin{array}{l} 10a^3b - 5a^2b^2 - 15ab \\ 5a(2a^2b - ab^2 - 3b) \end{array}$$



- Make Sense and Persevere** Write the difference in factored form.
 $(24x^4 - 15x^2 + 6x) - (10x^4 + 5x^2 - 4x)$
- Higher Order Thinking** In the expression $ax^2 + b$, the coefficients of a and b are multiples of 2. The coefficients c and d in the expression $cx^2 + d$ are multiples of 3. Will the GCF of $ax^2 + b$ and $cx^2 + d$ always, sometimes, or never be a multiple of 6? Explain.
- Make Sense and Persevere** What is the GCF in the expression $x(x + 5) - 3x(x + 5) + 4(x + 5)$?
- Look for Relationships** Find the greatest common factor of the terms $x^{n+1}y^n$ and $x^n y^{n-2}$, where n is a whole number greater than 2. How can you factor the expression $x^{n+1}y^n + x^n y^{n-2}$?
- Mathematical Connections** consider the following set of monomials.
 $A = \{2x, 3x, 4x, 5xy, 7x, 9y, 12xy, 13x, 15x\}$
The GCF the elements in subset $B = \{2x, 3x\}$ is x . Create 6 different subsets of A , such the GCFs of the elements are 1, $2x$, 3 , $4x$, $5x$, and y .

PRACTICE

Find the GCF of each group of monomials.

SEE EXAMPLE 1

- $8y^3$ and $28y$
- $9a^2b^3$, $15ab^2$, and $21a^4b^3$
- $18m^2$ and 25
- x^2y^3 and x^3y^5

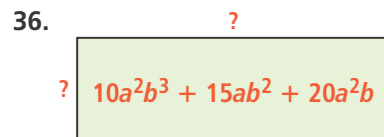
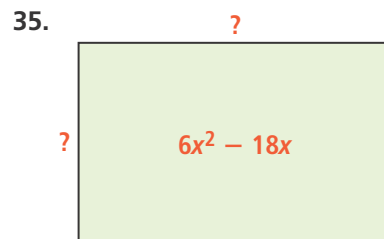
Factor out the GCF from each polynomial.

SEE EXAMPLE 2

- $12x^2 - 15x$
- $-4y^4 + 6y^2 - 14y$
- $3m^2 - 10m + 4$
- $24x^3y^2 - 30x^2y^3 + 12x^2y^4$

The areas of the rectangles are given. Use factoring to find expressions for the missing dimensions.

SEE EXAMPLE 3

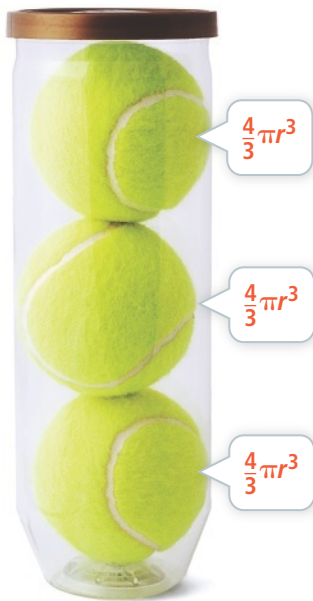


- A farmer wants to plant three rectangular fields so that the widths are the same. The areas of the fields, in square yards, are given by the expressions $12x^2y$, $9xy^2$, and $21xy$. What is the width of the fields if $x = 3$ and $y = 4$?

SEE EXAMPLE 3

APPLY

38. **Model With Mathematics** Write an expression in factored form to represent the volume in the canister not occupied by the tennis balls. Assume the canister is cylinder with volume $V = \pi r^2 h$.



39. **Use Structure** Determine the GCF and write the expression in factored form.
 $(6x^2 + 4x) + (4x^2 - 8x)$
40. **Make Sense and Persevere** A sheet of dough has six identical circles cut from it. Write an expression in factored form to represent the approximate amount of dough that is remaining. Is there enough dough for another circle?

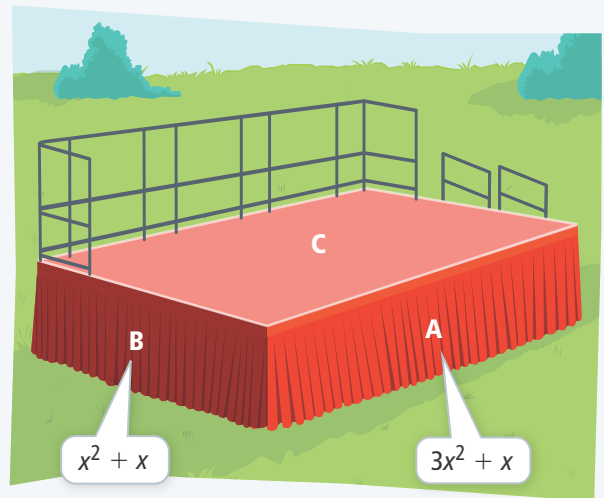


ASSESSMENT PRACTICE

41. Fill in the blanks to find the factor pairs for $18x^4 + 12x^3 - 24x^2$.

<input type="checkbox"/>	$6x^2 + 4x - 8$
$2x$	<input type="checkbox"/> $x^2 +$ <input type="checkbox"/> $x^2 -$ <input type="checkbox"/> x
x^2	$18x^2 + 12x - 24$
<input type="checkbox"/> x^2	$3x^2 + 2x - 4$

42. **SAT/ACT** The area of a rectangle is $12x^3 - 18x^2 + 6x$. The width is equal to the GCF. What could the dimensions of the rectangle be?
 Ⓐ $6x(2x^2 - 3x)$
 Ⓑ $3(4x^3 - 6x^2 + 2x)$
 Ⓒ $x(12x^2 - 18x + 6)$
 Ⓓ $6x(2x^2 - 3x + 1)$
43. **Performance Task** Camilla is designing a platform for an athletic awards ceremony. The areas for two of the three faces of a platform are given.



- Part A** What are the dimensions of each face of the platform?
- Part B** What is the area of the top of the platform?
- Part C** What expression represents the surface area of the entire platform, including the bottom?
- Part D** What expression represents the volume of the platform?