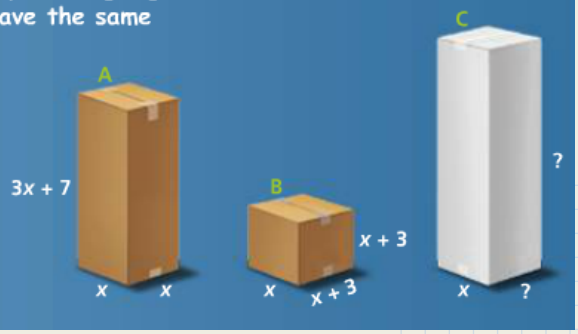
Algebra 1

Chapter 8
Section 8-8

Volume

A packaging company sells two kinds of boxes, Box A and Box B. The company is designing a new box, Box C, that will have the same volume as Boxes A and B combined. Suppose one dimension of Box C is x. What could be the other two dimensions? Explain your reasoning.

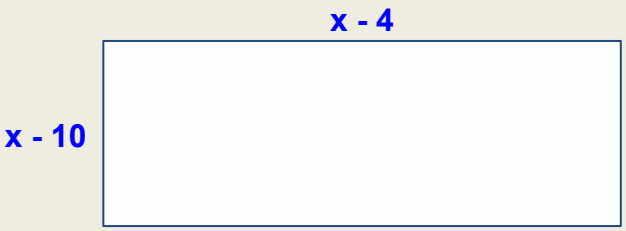


Volume A: $3x^3 + 7x^2$
Volume B: $x^3 + 6x^2 + 9x$
Volume C = Volume A + Volume B = $4x^3 + 13x^2 + 9x$

Factor:
$x(4x^2 + 13x + 9)$
|
| $4x^2 + 4x + 9x + 9$
| $4x(x + 1) + 9(x + 1)$
V
$x(x + 1)(4x + 9)$

Finding Dimensions

The area of a rectangle is given by the trinomial $x^2 - 14x + 40$. What are the possible dimensions of the rectangle? Use factoring.



Factor by Grouping

FACTOR:

$16x^2 - 6x - 1$

FACTOR:

$7x^3 + 4x^2 - 21x - 12$

FACTOR:

$12x^5 - 30x^4 + 18x^3 - 45x^2$

FACTOR:

$22x^3 + 33x^2 + 8x + 12$

$16x^2 - 8x + 2x - 1$
$8x(2x - 1) + 1(2x - 1)$
$(8x + 1)(2x - 1)$

$x^2(7x + 4) - 3(7x + 4)$
$(7x + 4)(x^2 - 3)$

Factoring Polynomials of a Degree of 4 or Higher

FACTOR

$4x^8 - 3x^7 - 10x^6 + 16x^4 - 12x^3 - 40x^2$

$x^2 (4x^6 - 3x^5 - 10x^4 + 16x^2 - 12x - 40)$
$x^2 [x^4(4x^2 - 3x - 10) + 4(4x^2 - 3x - 10)]$
$x^2(x^4 + 4)(4x^2 - 3x - 10)$

$4x^2 - 8x + 5x - 10$
$4x(x - 2) + 5 (x - 2)$
$x^2(x^4 + 4)(4x + 5)(x - 2)$