

Algebra 1

Chapter 8

Section 8-8

Mar 13-8:07 AM

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.

$V = L \cdot W \cdot H$

$V_A = x \cdot x \cdot (3x+7)$
 $V_A = x^2(3x+7)$
 $V_A = 3x^3 + 7x^2$

$V_B = (x+3)(x+3)x$
 $(x^2 + 3x + 3x + 9) \cdot x$
 $(x^2 + 6x + 9)x$
 $V_B = x^3 + 6x^2 + 9x$

$V_C = V_A + V_B$
 $V_C = (3x^3 + 7x^2) + (x^3 + 6x^2 + 9x)$
 $V_C = 4x^3 + 13x^2 + 9x$
 $x(4x^2 + 13x + 9)$
 $4x^2 + 4x + 9x + 9$
 $4x(x+1) + 9(x+1)$
 $x(x+1)(4x+9)$

$4 \cdot 9 = 36$
 $\frac{36}{4, 9}$

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

$$x^2 - 14x + 40 \leftarrow \text{Factor}$$

$$(x-10)(x-4)$$

$L = x - 4$

$x - 10 = W$



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The volume of a rectangular prism is given by the trinomial $2x^3 - 13x^2 - 7x$. What are the possible dimensions? Use factoring.

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Factoring by grouping

$$7x^3 + 4x^2 \mid - 21x - 12$$
$$x^2(\underline{7x+4}) - 3(\underline{7x+4})$$
$$(7x+4)(x^2-3)$$

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Factoring by grouping

$$22x^3 + 33x^2 \mid + 2x + 3$$
$$11x^2(\underline{2x+3}) + 1(\underline{2x+3})$$
$$(2x+3)(11x^2+1)$$

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Factoring by grouping

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

$$3x^2(4x^3 - 10x^2 + 6x - 15)$$

$$2x^2(2x-5) + 3(2x-5)$$

$$3x^2(2x-5)(2x^2+3)$$

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Factoring by grouping (EC on test)

$$2x^8 - 6x^7 - 8x^6 + 8x^4 - 24x^3 - 32x^2$$

$$2x^2(x^6 - 3x^5 - 4x^4 + 4x^2 - 12x - 16)$$

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

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

$$2x^4(x-4)(x+1)(x^4+4)$$

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