Objective: Solve context problems by factoring.

Concept

Steps to Solve a Quadratic Equation by Factoring

- 1. Write the equation is standard form, $ax^2 + bx + c = 0$.
- 2. Factor the polynomial completely, including any greatest common factor.
- 3. Use the Zero Product Property.
- 4. Solve for the values of the variable, x.
- 5. State the solution.

Zero Product Property

If the product of two factors is zero, then at least one of the factors must be equal to zero.

If
$$a \cdot b = 0$$
, then either $a = 0$ or $b = 0$.

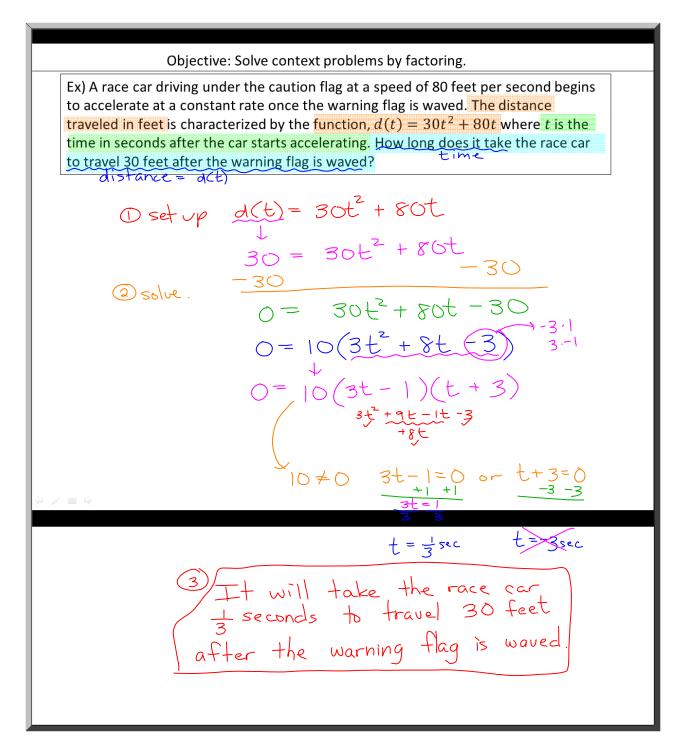
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Ex) The area of a room is 143 square feet. The length is
$$(2x + 1)$$
 feet and the width is $(3x - 7)$ feet. Find the dimensions of the room.

Ost of the area of a room is 143 square feet. The length is $(2x + 1)$ feet and the width is $(3x - 7)$ feet. Find the dimensions of the room.

Ost of the area of a room is 143 square feet. The length is $(2x + 1)$ feet and the width $(3x - 7)$ feet. Find the dimensions of the room are 13 feet and 11 feet.

Objective: Solve context problems by factoring. Ex) The height, in feet, of an object launched into the air can be modeled by the function $h(t) = -16t^2 + 16t + 96$ where t is in seconds. When does the object hit the ground? height = O feet $0 h(t) = -16t^{2} + 16t + 96$ $-1. [0 = -16t^{2} + 16t + 96]$ $O = 16t^2 - 16t - 96$ $0 = 16(t^{2} - t - 6)$ 0 = 16(t - 3)(t + 2) $16 \neq 0$, t-3=0 or t+2=0-2 -2The object hits the ground after 3 seconds.



Objective: Solve context problems by factoring.

Closure

Peter solved the following problem. His work is shown. Why isn't Peter's answer valid? What are the correct dimensions of the shed?

The width and length of a storage shed can be modeled by (x-3) feet and (x-10) feet. The area of the shed is 60 square feet. What are the dimensions of the shed?

$$(x-3)(x-10) = 60$$

$$x^{2}-13x+30 = 60$$

$$x^{2}-13x-30 = 0$$

$$(x-15)(x+2) = 0$$

$$x-15 = 0 \text{ or } x+2 = 0$$

$$x = 15 \text{ or } x = 2$$

Peter's answer isn't valid because he forgot to plug the x value of 15 back into the expressions for the dimensions. He also only has one dimension when there should be two. The correct dimensions of the shed are 5 feet and 12 feet.

The dimensions of the shed are 15 feet.