Unit 7 Lesson 4: Solving Quadratic Equations with the Zero Product Property

1 Math Talk: Solve These Equations (Warm up)

Student Task Statement

What values of the variables make each equation true?

$6 + 2a = 0$

$7b = 0$

$7(c - 5) = 0$

$g \cdot h = 0$

2 Take the Zero Product Property Out for a Spin

Student Task Statement

For each equation, find its solution or solutions. Be prepared to explain your reasoning.

1. $x - 3 = 0$
2. $x + 11 = 0$
3. $2x + 11 = 0$
4. $x(2x + 11) = 0$
5. $(x - 3)(x + 11) = 0$
6. $(x - 3)(2x + 11) = 0$
7. $x(x + 3)(3x - 4) = 0$

3 Revisiting a Projectile

Student Task Statement

We have seen quadratic functions modeling the height of a projectile as a function of time.

Here are two ways to define the same function that approximates the height of a projectile in meters, t seconds after launch:

$h(t) = -5t^2 + 27t + 18$ $\qquad\qquad$ $h(t) = (-5t - 3)(t - 6)$

1. Which way of defining the function allows us to use the zero product property to find out when the height of the object is 0 meters?
2. Without graphing, determine at what time the height of the object is 0 meters. Show your reasoning.