Solving Quadratic Equations by Factoring

Factoring is a method that can sometimes be used to help us determine the roots (solutions) of a quadratic equation.

Example 1:

Determine the roots of the following quadratic equations:

a. $75x^2 - 192 = 0$

b. $6x^2 = 20 - 7x$

c. $4x^2 + 49 = -28x$

Example 2:

The entry to the main exhibit hall in an art gallery is a parabolic arch. The arch can be modelled by the function

$$h(w) = -0.625w^2 + 5w$$

where the height, $h(w)$, and width, w, are measured in feet. Several sculptures are going to be delivered to the exhibit hall in crates. Each crate is a square-based rectangular prism that is 7.5 ft high, including the wheels. The crates must be handled as shown, to avoid damaging the fragile contents.

What is the maximum width of a 7.5 ft high crate that can enter the exhibit hall through the arch?

Solution:

Substitute the height, 7.5 ft, for h(w), then rearrange, simplify, and solve the equation for w:

The parabola reaches a height of 7.5 ft at widths of _____ ft and _____ ft. Therefore, to fit through the archway, the crate cannot be more than _____ ft wide.