Section 7.1 (Quadratic Equations; Solution by Factoring)

Quadratic equations are used in engineering applications especially those involving physics and motion. There is a very useful application described in the front of chapter 7. This same application is seen in aeronautics and space flight.

The objective for this section is to:

- Solve quadratic equations by factoring and using the zero product rule.

A quadratic equation is one that has a degree of two, or it has a squared term. It is not necessary for it to have an x term for it to be quadratic. The general form of a quadratic equation is:

$$ax^2 + bx + c = 0$$

Are these equations quadratic?

1. $(3x-2)^2 = 4$

2. $x(5x^2 + 3) = 7 + 2x^2$

Solve by factoring and using the zero product rule.

1. $x^2 - 16 = 0$

2. $x^2 = 0.16$

3. $x^2 + x - 6 = 0$

4. $15l = 20l^2$

5. $9x^2 = 9 - x(43 + x)$

6. The mass m (in Mg) of the fuel supply in the first-stage booster of a rocket is:

$$m = 135 - 6t - t^2$$

where t is the time (in seconds) after launch. When does the booster run out of fuel?

Finish riddle from previous packet.