Section 1.5
Solutions and Hints

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for the book:
Precalculus, Mathematics for Calculus 4th Edition
by James Stewart, Lothar Redlin and Saleem Watson.

22. Solve by factoring: $x^2 = 5(x + 100)$

$x^2 = 5x + 500$ → $x^2 - 5x - 500 = 0$

$(x - 25)(x + 20) = 0$

So x = 25 or x = -20 is the solution

28. Solve by completing the square: $3x^2 - 6x - 1 = 0$

Remember to take the leading coefficient of the x^2 term out:

$3(x^2 - 2x + \underline{\quad}) = 1$ Notice: $(-2/2)^2 = 1$

$3(x^2 - 2x + 1) = 1 + 1$

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

$(x - 1)^2 = 2/3$

$(x - 1) = \pm\sqrt{\dfrac{2}{3}}$

$x = 1 \pm \sqrt{\dfrac{2}{3}}$

75. Use the discriminant to determine the number of real solutions to: $x^2 - 6x + 1$

The discriminant $= b^2 - 4ac = (-6)^2 - 4*1*1 = 36 - 4 = 32$

$32 > 0$ so **the equation has 2 distinct real solutions**

84. A small appliance manufacturer finds that the profit P (in dollars) generated by producing *x* microwave ovens per week is given by the formula: P = 0.1*x*(300 − x) provided that 0 ≤ x ≤ 200. How many microwave ovens must be manufactured per week to generate a profit of $1250.00 ?

Multiply everything out and set = 1250, then solve for x.

$0.1*x*(300 - x) = 1250$

$30x - 0.1x^2 = 1250$

$0 = 0.1x^2 - 30x + 1250$ (multiply everything by 10, to get rid of decimal coeff)

$0 = x^2 - 300x + 12500$

$0 = (x - 250)(x - 50)$

So x = 250 or x = 50.

Notice the equation was only true for 0 ≤ x ≤ 200.

And we arrive at the solution of **x = 50 ovens produces a profit of $1250.**