5.3 Solving by Factoring

Recall: Equations in Factored Form

Where are the zeros/ x-intercepts?

Equation	$y = (x - 4)(x + 2)$	$y = x (x - 5)$	$y = (x + 3)^2$
Roots			
Sketch			

Recall: The zeros/x-intercepts/roots are the values of x that cause the
function, y, to equal zero.

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

Where are the zeros for the following?

$y = (2x + 1)(3x - 2)$	$y = x(5x - 2)$	$y = (2x + 7)^2$

Finding the zeros of $\quad y = ax^2 + bx + c$
  is the same as
solving the equation $\quad ax^2 + bx + c = 0$

<u>To Solve a Quadratic Equation</u>:
- write in the form $ax^2 + bx + c = 0$
- fully factor
- determine the value of x that makes each factor equal to zero

Ex. 1 Solve.

a) $(x - 5)(2x + 3) = 0$

b) $x (3x - 5) = 0$

c) $x^2 + 4x - 5 = 0$

d) $x^2 - 7x + 12 = 0$

e) $2x^2 + 5x - 3 = 0$

f) $10x^2 + 19x + 6 = 0$

Ex. 2 Solve.

a) $3y^2 + 15y + 18 = 0$

b) $2x^2 - 8x = 0$

c) $4b^2 - 9 = 0$

d) $-m^2 + 7m - 10 = 0$

e) $4x^2 + 14x = 8$

f) $w^2 + 4 = 3w(w - 5)$

Ex. 3 Write a quadratic equation having roots:

a) 3, -2

b) ¾, -½

Ex. 4   A ball is thrown from a cliff. Its height, h, in metres, above the sea, after t seconds, can be modelled by the equation $h = -5t^2 + 21t + 120$. How long will the ball take to fall 20 m below its initial height?