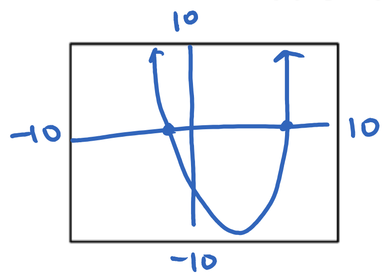
FOM11 7.3 Solving Quadratic Equations by Graphing

A **quadratic function** is of the form $y = ax^2 + bx + c$. To solve a quadratic function means to find the x-intercepts, called the **zeroes.**

A **quadratic equation** is of the form $ax^2 + bx + c = 0$. To solve a quadratic equations means to find the x-intercepts, called the **roots.**

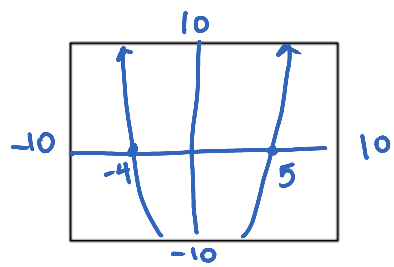
Example 1: Solve $3x^2 - 11x - 4 = 0$ using graphing. (ie. Find the roots.)



(-0.333, 0)
and
(4, 0)

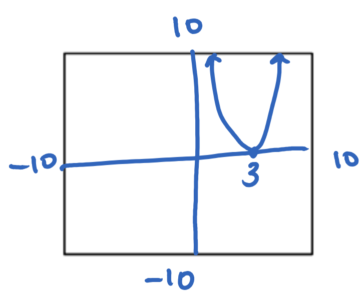
Roots
$x = -0.\overline{3}, 4$

Example 2: Find the zeroes for $y = x^2 - x - 20$.



Zeroes:
$x = -4, 5$

Example 3: What are the roots for $x^2 - 6x + 9 = 0$?



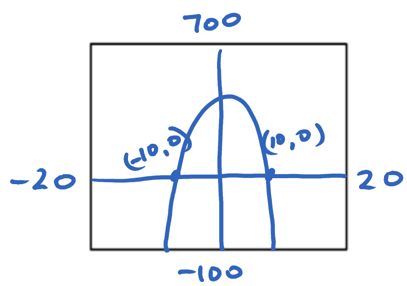
Roots:

$x = 3$

Example 4: The manager at Suzie's Fashion Store has determined that the function $R(x) = 600 - 6x^2$ models the expected weekly revenue, R, in dollars, from sweatshirts as the price changes, where x is the change in price, in dollars. What price increase or decrease will result in no revenue?

No revenue means
$R(x) = 0$

$0 = 600 - 6x^2$



A price increase of \$10 (+10) or a price decrease \$10 (-10) will result in no revenue.

Example 5: Solve $3x^2 - 6x + 5 = 2x(4 - x)$ by graphing.

Goal – Make one side = 0

$3x^2 - 6x + 5 = 2x(4 - x)$

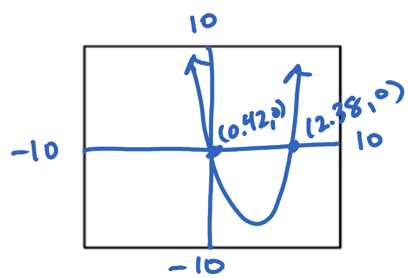
$3x^2 - 6x + 5 = 8x - 2x^2$

$+2x^2 \qquad\qquad +2x^2$

$5x^2 - 6x + 5 = 8x$

$-8x \qquad\qquad -8x$

$5x^2 - 14x + 5 = 0$



$\boxed{x = 0.42,\ 2.38}$

Example 6: Lamont runs a boarding kennel for dogs. He wants to construct a rectangular play space for the dogs, using 40 m of fencing and an existing wall as one side of the play space.

a. Write a function that describes the area, A, of the play space in terms of any width, w.

b. Determine the number of possible widths for an area of:

i. $250\ m^2$

ii. $200\ m^2$

iii. $150\ m^2$

Assignment: ~~pg. 379 #5-7, 10-12~~

HW p. 379 #4-7