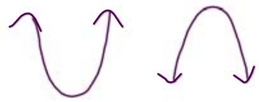


We can even explore higher-order polynomials and their zeroes on a very limited basis. So far the best we have done is an x^2, but polynomials that contain an x^3 can also be analyzed. These are known as **cubics**.

***Exercise* #3:** Consider the cubic function $\boxed{f(x)=x^3-9x.}$

(a) Find the zeroes of this function algebraically by factoring.

$x^3-9x=0$

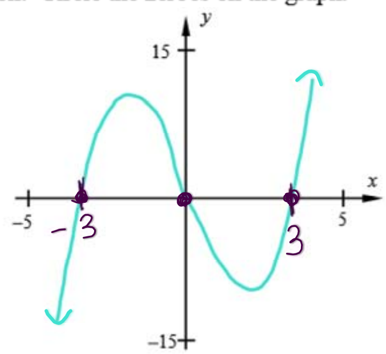
$x(x^2-9)=0$

$x(x-3)(x+3)=0$

$\boxed{x=0}$ $\quad x-3=0 \quad x+3=0$

$\boxed{x=3}$ $\quad \boxed{x=-3}$

(b) Use your calculator to sketch a graph of this function. Circle the zeroes on the graph.



You will study higher-order polynomial functions in Algebra II. But, you should be able to find the zeroes for a limited number of **cubic polynomials** that can be easily factored. In our last exercise, we'd like to explore the relationship between the **zeroes of a quadratic** and the *x*-coordinate of its turning point.

***Exercise* #4:** Consider the quadratic $y=x^2-8x+15$.

(a) Find the zeroes of this function algebraically using factoring.

5 and 3

-5 and -3

A M

$x^2-8x+15=0$

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

$\boxed{x=5}$ $\boxed{x=3}$

(b) Write the quadratic function in vertex form and identify the coordinates of its turning point.

$\frac{-8}{2}=(-4)^2=16$

$x^2-8x+\boxed{16}-\boxed{16}+15$

$\boxed{y=(x-4)^2-1}$

T.P. $\rightarrow$ $(4,-1)$

(c) What is true about the *x*-coordinate of the turning point compared to the zeroes you found in (a)?

x-coordinate of turning point $\rightarrow$ 4

zeros $\rightarrow$ 3 and 5

(d) Without using a calculator, sketch a graph of this quadratic on the axes below.