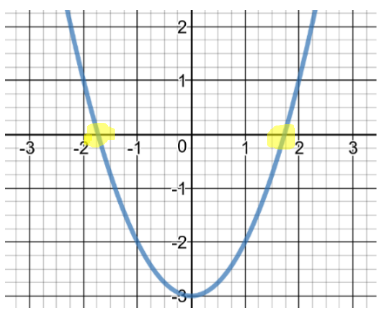
X-intercepts, Multiplicities, and Y-intercepts

Like quadratics in standard form (which a quadratic is also a polynomial) the y-intercept is the constant since a y-intercept has the coordinate point (0,y); we simply substitute in 0 for all x values which will leave us with just the constant:

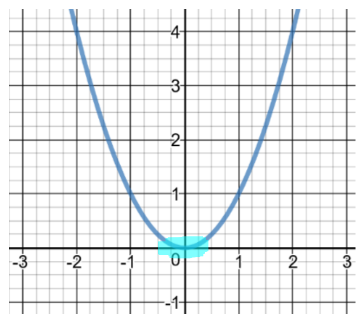
For example: the y-intercept of $y = 5x^7 + 3x^5 - x^2 + 11$ is (0, 11). And if we are given the function graphically we simply look for where the graph crosses the y-axis.

X-intercept are a little harder especially algebraically (we will look at that a different time). Here you will only be asked to look at a graph and determine the x-intercepts.

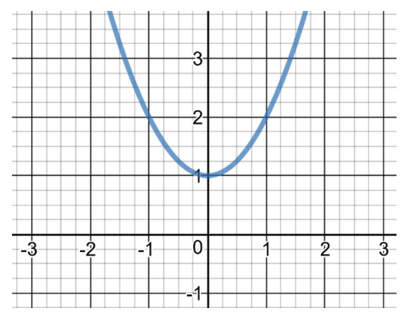
For x-intercept look at where the graph crosses the x-axis. The number of x-intercepts is less than or equal to the degree of the polynomial
$(\# \, of \;\, x - int. \leq n \; where \; n \; is \; the \; degree)$



This quadratic has two real x-intercepts which matches the degree.



This quadratic appears to have one real x-intercept; however, it gets counted twice (we just don't write it twice. $y = x^2 = x \cdot x$ each x produces a zero just the same



This quadratic has no real roots; however, it does have two imaginary roots. If we solved $y = x^2 + 1$ we would produce an imaginary

Notice the number of roots whether real or imaginary add up to the degree.