Characteristics of Polynomial Functions

Domain & Range

Domain and Range are written in interval notation.
Domain describes x-values

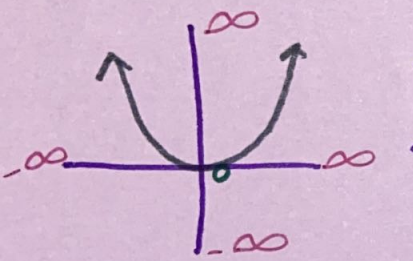
and range describes y-values

Domain: left, right Range: bottom, top

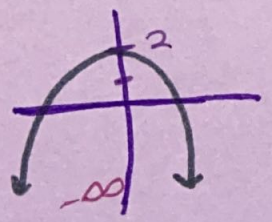
Use (or) when the # value is NOT included in the domain or range

Use [or] when the # value IS included in the domain or range

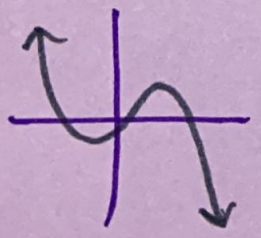
Always use (or) with ∞ or −∞



Domain: $(-\infty, \infty)$
Range: $[0, \infty)$



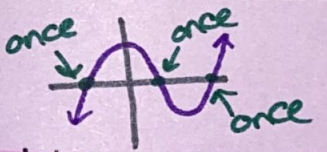
D: $(-\infty, \infty)$
R: $(-\infty, 2]$

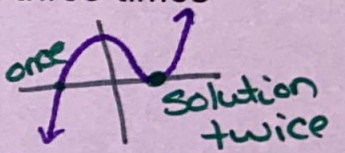


D: $(-\infty, \infty)$
R: $(-\infty, \infty)$

Intercepts

- X-intercepts are where the graph crosses or touches the x-axis
  - Also called roots, zeros or solutions
  - Written as (#, 0)
  - To find algebraically, set function = 0 and solve for x
  - If graph crosses the x-axis, that zero is a zero once
  - If graph "bounces" off the x-axis, that zero is a zero twice
  - If graph "wiggles" through the x-axis, that zero is a zero three times





- Y-intercepts are where the graph crosses or touches the y-axis
  - Written as (0, #)
  - To find algebraically, substitute 0 for x in function and simplify or it is just the constant

$f(x) = x^3 - x^2 - 6x$

x-intercepts $(y=0)$

$0 = x^3 - x^2 - 6x$ (0,0)
$0 = x(x^2 - x - 6)$ (3,0)
$0 = x(x-3)(x+2)$ (-2,0)
$x = 0$ $x - 3 = 0$ $x + 2 = 0$
$x = 3$ $x = -2$

y-int. $(x=0$

$y = (0)^3 - (0)^2 - 6(0)$
$y = 0$ (0,0)