Linear

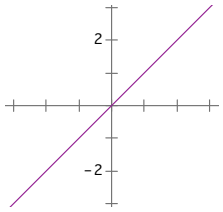
$y = ax + b$

independent variable is to the first power

to solve get the x's on one side and the numbers on the other

looks like a line

have to know to graph: slope and a point



Quadratic

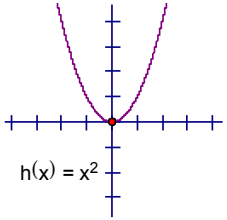
$y = ax^2 + bx + c$

independent variable is squared

to solve set = 0 and factor and use the zero-product rule OR complete the square OR use quadratic formula

looks like a parabola

have to know to graph: vertex and up/down



Polynomial

$y = a_n x^n + a_{n-1} x^{n-1} + \ldots a_0$

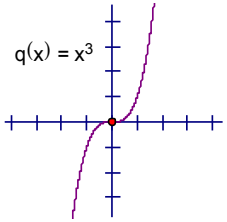
all exponents on x's are whole numbers and terms are added

"sum of terms" and "terms are products of numbers and variables to whole number powers"

to solve set = 0 and factor and use zero-product rule or use calculator to graph or find zeroes

simple curves

have to know to graph: zeroes and end behavior



Rational

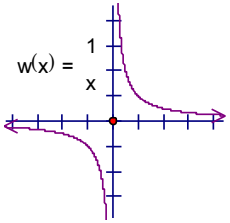
$y = \dfrac{p(x)}{q(x)}$

a fraction made out of two polynomials, in particular, x's in the denominator

domain issues – can't have zero in denominator

to solve multiply both sides of equation by the LCM and solve the resulting equation – MUST CHECK!

graph often has asymptotes



Radical

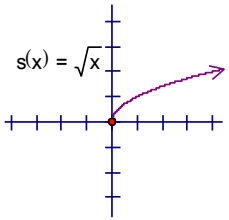
$y = \sqrt{x}$

x under a radical

domain issues – radicand must be positive or 0

to solve use IRS:
Isolate the radical
Raise both sides to the appropriate power
Solve the resulting equation
MUST CHECK!

looks like half a sideways parabola



Absolute Value

$y = |x|$

x inside absolute value bars

looks like a "V"

to solve isolate the absolute value and use the rules:

$|x| = d \Leftrightarrow x = d \text{ or } x = -d$

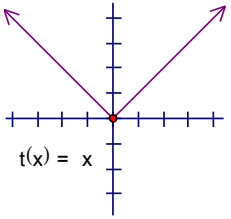
$|x| > d \Leftrightarrow x > d \text{ or } x < -d$

$|x| < d \Leftrightarrow -d < x < d$

OR use the definition:

$$|x| = \begin{cases} x, & \text{if } x \geq 0 \\ -x, & \text{if } x < 0 \end{cases}$$

looks like a "v"



Exponential

$y = b^x$

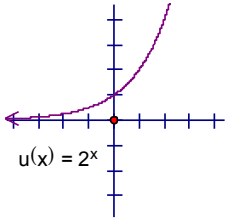
base is constant and the variable is in the exponent

y is always positive

to solve isolate the exponential and log both sides or force the bases to be the same

important points:
(0, 1) and (1, b)

have to know to graph: increasing/decreasing and important points



Logarithmic

$y = \log_b x$

x in the argument of a log

domain issues – argument must be strictly positive

to solve combine all logs, switch to exponential form, and solve the resulting equation – MUST CHECK!

important points:
(1, 0) and (b, 1)

have to know to graph: increasing/decreasing and important points