

KEY

Important Functions to Know: 1. WITHOUT using a calculator complete the following chart for the given functions. 2. SKETCH each function on the back of this handout.

Function (Parent)	Domain (Use Interval Notation)	Range (Use Interval Notation)	Zeros (y=0) x-value of x-int.	Symmetry (y-axis, origin or neither)	Even, Odd Or Neither	Periodic (Yes/No) repeats?	One-to-one (Yes/No) Horizontal Line Test	Points of Discontinuity (circle, v.h., holes, etc.)
1.) $f(x) = x$ Linear	$(-\infty, \infty)$	$(-\infty, \infty)$	$x = 0$	origin	odd	no	YES	—
2.) $f(x) = x^2$ Quadratic	$(-\infty, \infty)$	$[0, \infty)$	$x = 0$	y-axis	even	no	no	—
3.) $f(x) = x^3$ Cubic	$(-\infty, \infty)$	$(-\infty, \infty)$	$x = 0$	origin	odd	no	YES	—
4.) $f(x) =  x $ Abs. Value	$(-\infty, \infty)$	$[0, \infty)$	$x = 0$	y-axis	even	no	no	—
5.) $f(x) = \sin x$ Sine	$(-\infty, \infty)$	$[-1, 1]$	$x = \pi n$	origin	odd	YES	no	—
6.) $f(x) = \cos x$ Cosine	$(-\infty, \infty)$	$[-1, 1]$	$x = \frac{\pi}{2} + \pi n$	y-axis	even	YES	no	—
7.) $f(x) = \tan x$ Tangent	$x \neq \frac{\pi}{2}n$	$(-\infty, \infty)$	$x = \pi n$	origin	odd	YES	no	V.A.s: $x = \frac{\pi}{2}n$
8.) $f(x) = \sin^{-1} x$ Inverse Sine	$[-1, 1]$	$[-\frac{\pi}{2}, \frac{\pi}{2}]$	$x = 0$	origin	odd	no	YES	—
9.) $f(x) = \cos^{-1} x$ Inverse cosine	$[-1, 1]$	$[0, \pi]$	$x = 1$	neither	N	no	YES	—
10.) $f(x) = \tan^{-1} x$ Inverse Tangent	$(-\infty, \infty)$	$(-\frac{\pi}{2}, \frac{\pi}{2})$	$x = 0$	origin	odd	no	YES	—
11.) $f(x) = e^x$ Exponential	$(-\infty, \infty)$	$(0, \infty)$	$\emptyset$	neither	N	no	YES	—
12.) $f(x) = \ln x$ Natural Log.	$(0, \infty)$	$(-\infty, \infty)$	$x = 1$	neither	N	no	YES	—
13.) $f(x) = \frac{1}{x}$ Rational	$(-\infty, 0) \cup (0, \infty)$	$(-\infty, 0) \cup (0, \infty)$	$\emptyset$	origin	odd	no	YES	V.A.: $x = 0$
14.) $f(x) = \frac{1}{x^2}$ Rational	$(-\infty, 0) \cup (0, \infty)$	$(0, \infty)$	$\emptyset$	y-axis	even	no	no	V.A.: $x = 0$
15.) $f(x) = \sqrt{x}$ Root	$[0, \infty)$	$[0, \infty)$	$x = 0$	neither	N	no	YES	—
16.) $f(x) = \sqrt{a^2 - x^2}$ Semi-circle	$[-a, a]$	$[0, a]$	$x = \pm a$	y-axis	even	no	no	—

$x^2 + y^2 = a^2$   
(solve for  $y = \pm \square$ )

