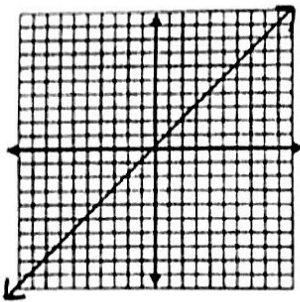


AP Calculus AB
Elementary Functions Worksheet

→ label axes

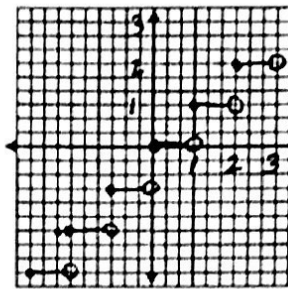
For each of the following functions, (a) graph, (b) find the domain using interval notation, (c) find the range using interval notation, (d) find the roots/zeros, (e) find the symmetry (if any) with respect to the y-axis or origin, (f) determine if the function is even or odd, (g) determine if the function is periodic and state the period, (h) determine if the function is one-to-one, and (i) state the x-coordinates of any points of discontinuity.

1) $f(x) = x$



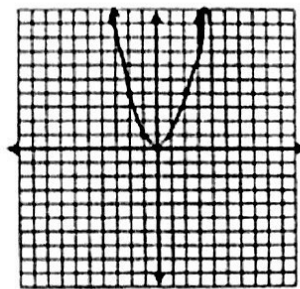
Domain: $(-\infty, \infty)$
Range: $(-\infty, \infty)$
Roots/Zeros: $x = 0$
Symmetry: origin
Even/Odd: odd
Periodic? no
One-to-One: yes
Discontinuous: no

5) $f(x) = [x]$



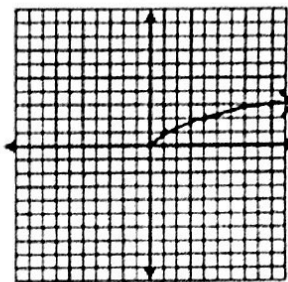
Domain: $(-\infty, \infty)$
Range: $\{y \mid y \in \mathbb{Z}\}$
Roots/Zeros: $\{0, 1\}$
*Symmetry: none not origin!
Even/Odd: neither
Periodic? no
One-to-One: no
Discontinuous: $\{x \mid x \in \mathbb{Z}\}$

2) $f(x) = x^2$



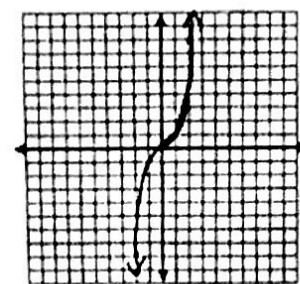
Domain: $(-\infty, \infty)$
Range: $[0, \infty)$
Roots/Zeros: $x = 0$
Symmetry: y-axis
Even/Odd: even
Periodic? no
One-to-One: no
Discontinuous: no

6) $f(x) = \sqrt{x}$



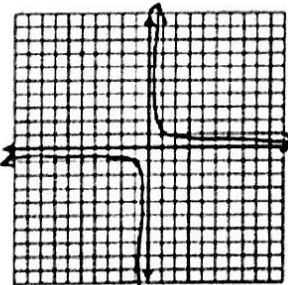
Domain: $[0, \infty)$
Range: $[0, \infty)$
Roots/Zeros: $x = 0$
Symmetry: none
Even/Odd: neither
Periodic? no
One-to-One: yes
Discontinuous: no

3) $f(x) = x^3$



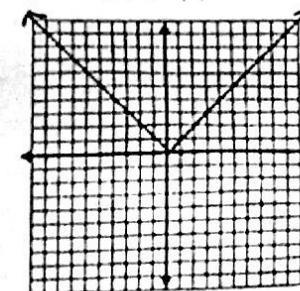
Domain: $(-\infty, \infty)$
Range: $(-\infty, \infty)$
Roots/Zeros: $x = 0$
Symmetry: origin
Even/Odd: odd
Periodic? no
One-to-One: yes
Discontinuous: no

7) $f(x) = \frac{1}{x}$



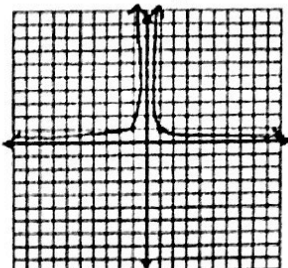
Domain: $(-\infty, 0) \cup (0, \infty)$
Range: $(-\infty, 0) \cup (0, \infty)$
Roots/Zeros: none
Symmetry: origin
Even/Odd: odd
Periodic? no
One-to-One: yes
Discontinuous: $x = 0$

4) $f(x) = |x|$



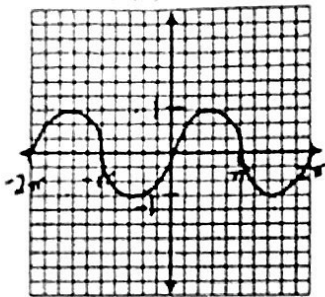
Domain: $(-\infty, \infty)$
Range: $[0, \infty)$
Roots/Zeros: $x = 0$
Symmetry: y-axis
Even/Odd: even
Periodic? no
One-to-One: no
Discontinuous: no

8) $f(x) = \frac{1}{x^2}$



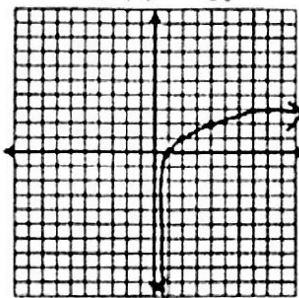
Domain: $(-\infty, 0) \cup (0, \infty)$
Range: $(0, \infty)$
Roots/Zeros: none
Symmetry: y-axis
Even/Odd: even
Periodic? no
One-to-One: no
Discontinuous: $x = 0$

9) $f(x) = \sin x$



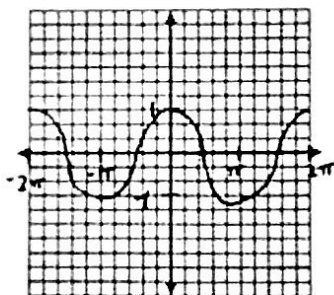
Domain: $(-\infty, \infty)$
 Range: $[-1, 1]$
 Roots/Zeros: $\{x | x = \pi n\}$
 Symmetry: origin
 Even/Odd: odd
 Periodic? yes, 2π
 One-to-One: no
 Discontinuous: no

14) $f(x) = \log_2 x$



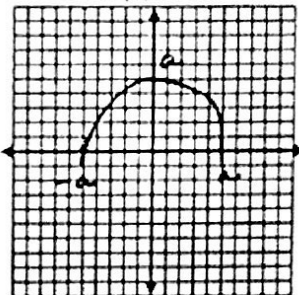
Domain: $(0, \infty)$
 Range: $(-\infty, \infty)$
 Roots/Zeros: $x = 1$
 Symmetry: none
 Even/Odd: neither
 Periodic? no
 One-to-One: yes
 Discontinuous: no

10) $f(x) = \cos x$



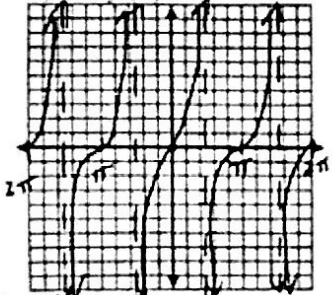
Domain: $(-\infty, \infty)$
 Range: $[-1, 1]$
 Roots/Zeros: $\{x | x = \frac{\pi}{2} + \pi n\}$
 Symmetry: y-axis
 Even/Odd: even
 Periodic? yes, 2π
 One-to-One: no
 Discontinuous: no

15) $f(x) = \sqrt{a^2 - x^2}$



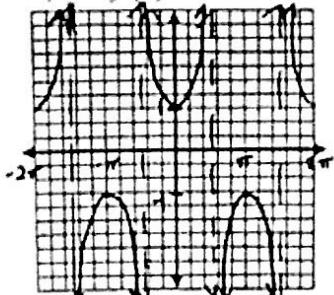
Domain: $[-a, a]$
 Range: $[0, a]$
 Roots/Zeros: $x = \pm a$
 Symmetry: y-axis
 Even/Odd: even
 Periodic? no
 One-to-One: no
 Discontinuous: no

11) $f(x) = \tan x$



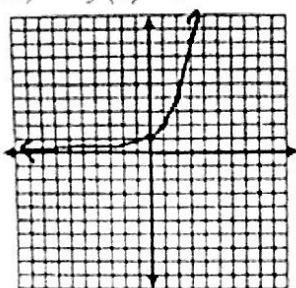
Domain: $\{x | x \neq \frac{\pi}{2} + \pi n\}$
 Range: $(-\infty, \infty)$
 Roots/Zeros: $\{x | x = \pi n\}$
 Symmetry: origin
 Even/Odd: odd
 Periodic? yes, π
 One-to-One: no
 Discontinuous: $\{x | x = \frac{\pi}{2} + \pi n\}$

12) $f(x) = \sec x$



Domain: $\{x | x \neq \frac{\pi}{2} + \pi n\}$
 Range: $(-\infty, -1] \cup [1, \infty)$
 Roots/Zeros: none
 Symmetry: y-axis
 Even/Odd: even
 Periodic? yes, 2π
 One-to-One: no
 Discontinuous: $\{x | x = \frac{\pi}{2} + \pi n\}$

13) $f(x) = 2^x$



Domain: $(-\infty, \infty)$
 Range: $(0, \infty)$
 Roots/Zeros: none
 Symmetry: none
 Even/Odd: none
 Periodic? no
 One-to-One: yes
 Discontinuous: no