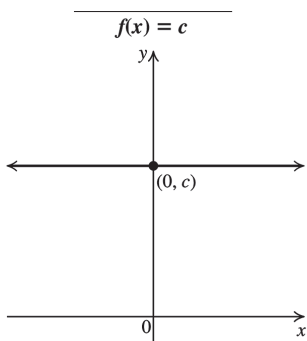


Section 2.6: A Library of Functions**Key Topics:** miscellaneous functions**Linear Functions**

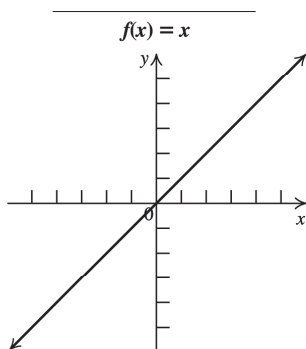
Let m and b be real numbers. The function $f(x) = mx + b$ is called a _____. If $m = 0$, the function $f(x) = b$ is called a _____. If $m = 1$ and $b = 0$, the resulting function $f(x) = x$ is called the _____.

Graph the piecewise function $f(x) = \begin{cases} 2x+1 & \text{if } x < -1 \\ 5 & \text{if } x = -1 \\ 3x-4 & \text{if } x > -1 \end{cases}$

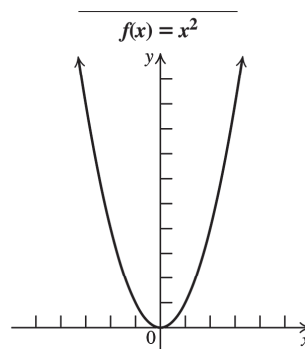
A LIBRARY OF BASIC FUNCTIONS



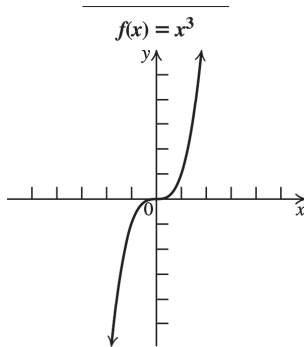
Domain: $(-\infty, \infty)$
 Range: $\{c\}$
 Constant on $(-\infty, \infty)$
 Even function (y-axis symmetry)



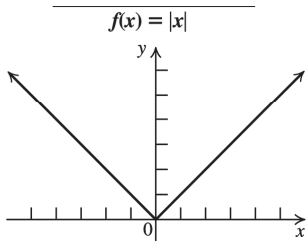
Domain: $(-\infty, \infty)$
 Range: $(-\infty, \infty)$
 Increasing on $(-\infty, \infty)$
 Odd function (origin symmetry)



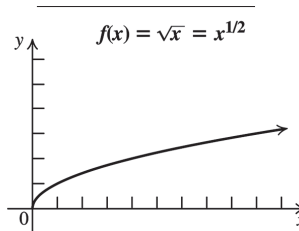
Domain: $(-\infty, \infty)$
 Range: $[0, \infty)$
 Decreasing on $(-\infty, 0)$
 Increasing on $(0, \infty)$
 Even function (y-axis symmetry)



Domain: $(-\infty, \infty)$
 Range: $(-\infty, \infty)$
 Increasing on $(-\infty, \infty)$
 Odd function (origin symmetry)

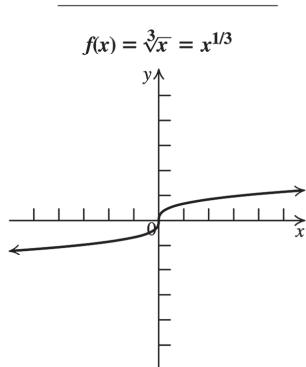


Domain: $(-\infty, \infty)$
 Range: $[0, \infty)$
 Decreasing on $(-\infty, 0)$
 Increasing on $(0, \infty)$
 Even function (y-axis symmetry)

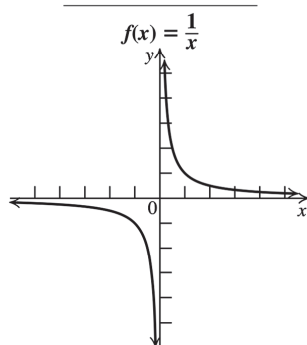


Domain: $[0, \infty)$
 Range: $[0, \infty)$
 Increasing on $(0, \infty)$
 Neither even nor odd (no symmetry)

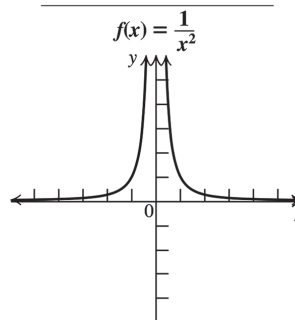
A LIBRARY OF BASIC FUNCTIONS (continued)



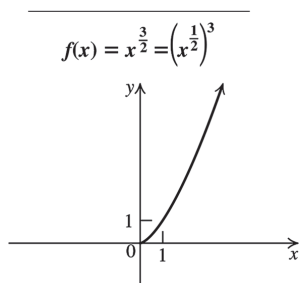
Domain: $(-\infty, \infty)$
 Range: $(-\infty, \infty)$
 Increasing on $(-\infty, \infty)$
 Odd function (origin symmetry)



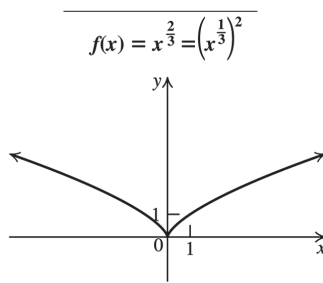
Domain: $(-\infty, 0) \cup (0, \infty)$
 Range: $(-\infty, 0) \cup (0, \infty)$
 Decreasing on $(-\infty, 0) \cup (0, \infty)$
 Odd function (origin symmetry)



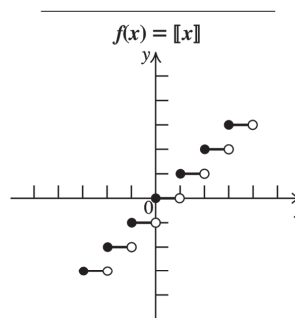
Domain: $(-\infty, 0) \cup (0, \infty)$
 Range: $(0, \infty)$
 Increasing on $(-\infty, 0)$
 Decreasing on $(0, \infty)$
 Even function (y-axis symmetry)



Domain: $[0, \infty)$
 Range: $[0, \infty)$
 Increasing on $(0, \infty)$
 Neither even nor odd
 (no symmetry)



Domain: $(-\infty, \infty)$
 Range: $[0, \infty)$
 Decreasing on $(-\infty, 0)$
 Increasing on $(0, \infty)$
 Even function (y-axis symmetry)



Domain: $(-\infty, \infty)$
 Range: $\{\dots -3, -2, -1, 0, 1, 2, 3, \dots\}$
 Neither even nor odd (no symmetry)