Learning Activity 1: Section 1.1
8/29/2006

1. $f(x) = 2x + 3$

Numerical description:

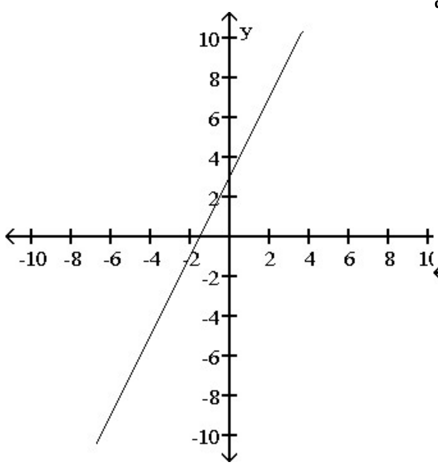
x	f(x)
-10	-17
-8	-13
-6	-9
-4	-5
-2	-1
0	3
2	7
4	11
6	15
8	19
10	23

Domain: [-10, 10],
Range: [-17, 23].

The function is increasing on the interval [-10, 10], and is never decreasing.

The function is neither even—since f(-2) $\neq$ f(2)—nor odd—since f(-2) $\neq$ –f(2).

The function is a linear function, which is a special case of polynomial, rational, and algebraic functions.



2.

$$f(x) = (x-3)^3$$
$$= x^3 - 9x^2 + 27x - 27$$

Numerical description:

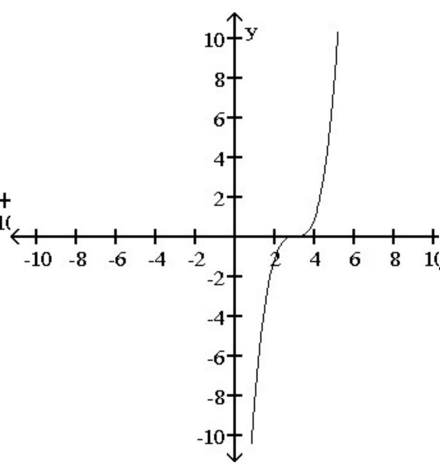
x	f(x)
-10	-2197
-8	-1331
-6	-729
-4	-343
-2	-125
0	-27
2	-1
4	1
6	27
8	125
10	343

Domain: [-10, 10]
Range: [-2197, 343]

The function is increasing on the intervals [-10, 3) and (3, 10], and is never decreasing.

The function is neither even—since f(-2) $\neq$ f(2)—nor odd—since f(-2) $\neq$ –f(2).

The function is a polynomial, which is a special case of rational and algebraic functions.



3.

$$f(x) = (2-(1-x)^2)^{-1/2}$$
$$= \frac{1}{\sqrt{1+2x-x^2}}$$

Numerical description:

x	f(x)
$1-\sqrt{2}$	undefined
$1.1-\sqrt{2}$	1.914449085
$\sqrt{2}-1.1$	.8085321580
1	$\sqrt{2}/2 \approx .707$
$2.5-\sqrt{2}$	0.708411338
$3.5-\sqrt{2}$	1.103596937
$1+\sqrt{2}$	undefined

Domain: $(1-\sqrt{2}, 1+\sqrt{2})$
Range: $[\sqrt{2}/2, \infty)$

The function is increasing on the interval $(1,\ 1+\sqrt{2})$ and is decreasing on the interval $(1-\sqrt{2}$, 1).

The function is neither even—since $f(1.1-\sqrt{2}) \neq f(\sqrt{2}-1.1)$—nor odd—since $f(1.1-\sqrt{2}) \neq -f(\sqrt{2}-1.1)$.

The function is algebraic.