Key

Unit 2 (2.1) **Basics of Function Notes**

- Domain: inputs or x-values
- Range: outputs or y-values
  - Domain (of a graph): From left to right
  - Range (of a graph): From bottom to top
    - Symbols:
      - From a table, ordered pairs, or mapping diagram use a list with {
      - For a graph ending in a ● use a [
      - For a graph ending in an arrow ↘ or **o** use a (
      - Using an arrow also signifies no end to the graph, so use $-\infty$ or ∞
- Function: each x has exactly 1 y * all x-values must be different *
  - For graphs use the Vertical line test

Function Notation

- $f(x), g(x), h(x)$ ...
  - is the same as y
  - means that the relation is a function
  - gives the equation a name
- $f(4)$ means to plug 4 in for x and simplify →

$$f(x) = 2x - 6$$
$$f(4) = 2(4) - 6$$
$$f(4) = 8 - 6$$
$$f(4) = 2$$

- $g(h(-2))$ means to substitute twice. → $h(x) = -3x + 8$

$$h(-2) = -3(-2) + 8$$
$$h(-2) = 6 + 8$$
$$h(-2) = 14$$

$$g(x) = \frac{1}{2}x - 5$$
$$g(14) = \frac{1}{2}(14) - 5$$
$$g(14) = 7 - 5$$
$$g(14) = 2$$

*Start on the inside, work your way out

You try: If $k(x) = 2x^2 - 5$ and $m(x) = \frac{x}{4}$ Find a. $m(32)$ b $k(-3)$ *c. $k(m(20))$

$m(32) = \frac{32}{4}$

$= 8$

$k(-3) = 2(-3)^2 - 5$

$2(9) - 5$

$18 - 5$

13

$m(20) = \frac{20}{4} = 5$

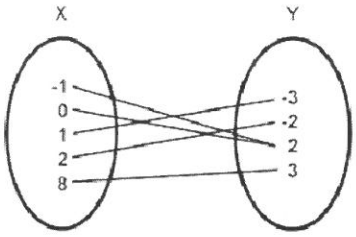
$k(5) = 2(5)^2 - 5$

$2(25) - 5$

$50 - 5$

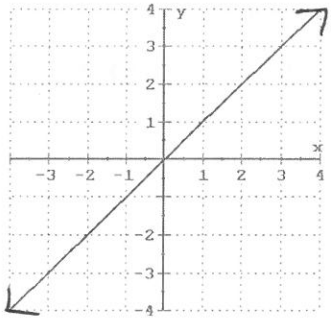
45

Functions



Domain: $\{-1, 0, 1, 2, 8\}$

Range: $\{-3, -2, 2, 3\}$



Domain: $(-\infty, \infty)$

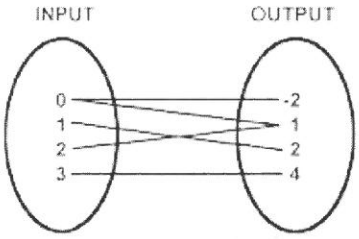
Range: $(-\infty, \infty)$

x	y
-2	-2
-1	2
0	6
1	10
2	14

Domain: $\{-2, -1, 0, 1, 2\}$

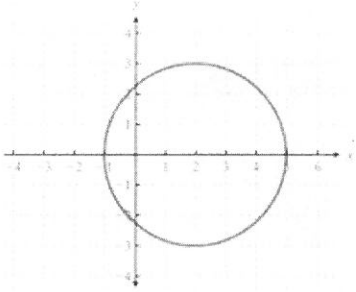
Range: $\{-2, 2, 6, 10, 14\}$

Not functions



Domain: $\{0, 1, 2, 3\}$

Range: $\{-2, 1, 2, 4\}$



Domain: $[-1, 5]$

Range: $[-3, 3]$

X	Y
1	2
2	4
1	5
3	8
4	4
5	10

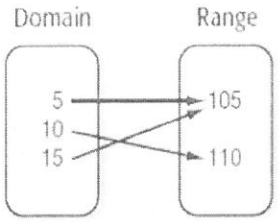
Domain: $\{1, 2, 3, 4, 5\}$

Range: $\{2, 4, 5, 8, 10\}$

Determine whether each relation is a function and then state the domain and range.

Function?

(Y) or N



Domain: $\{5, 10, 15\}$

Range: $\{105, 110\}$

Function?

Y or (N)

x	y
−2	−1
−2	1
−1	0
1	0
2	1

Domain: $\{-2, -1, 1, 2\}$

Range: $\{-1, 1, 0\}$

$\{(-3, 4), (-2, 4), (-1, -1), (3, -1)\}$

Function?

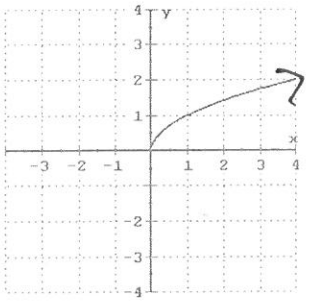
(Y) or N

Domain: $\{-3, -2, -1, 3\}$

Range: $\{4, -1\}$

Function?

(Y) or N

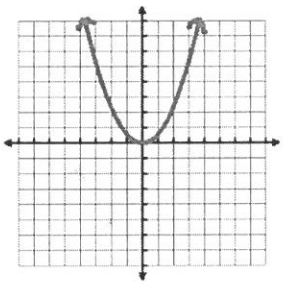


Domain: $[0, \infty)$

Range: $[0, \infty)$

Function?

(Y) or N

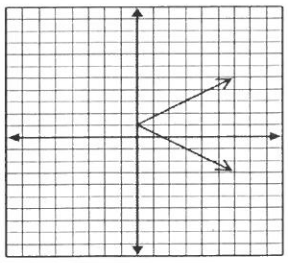


Domain: $(-\infty, \infty)$

Range: $[0, \infty)$

Function?

Y or (N)



Domain: $[0, \infty)$

Range: $(-\infty, \infty)$

Function?

Y or (N)

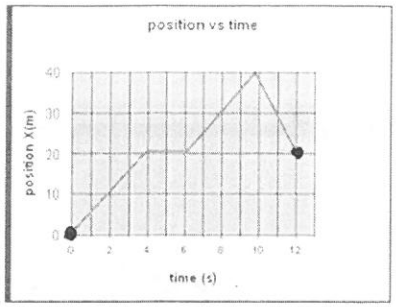
x	y
-4	-4
-2	-2
1	0
1	1

Domain: $\{-4, -2, 1\}$

Range: $\{-4, -2, 0, 1\}$

Function?

(Y) or N



Domain: $[0, 12]$

Range: $[0, 40]$

$(-5,6)\ (-10,7)\ (3,8)\ (5,6)\ (-5,7)$

Function?

Y or (N)

Domain: $\{-5, -10, 3, 5\}$

Range: $\{6, 7, 8\}$

Function?

(Y) or N

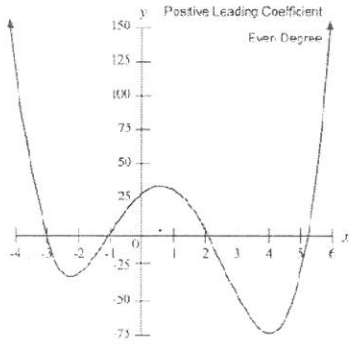
x	y
1	2
2	4
3	6

Domain: $\{1, 2, 3\}$

Range: $\{2, 4, 6\}$

Function?

(Y) or N



Domain: $(-\infty, \infty)$

Range: $[-75, \infty)$

Function?

(Y) or N

$y = x^3 + 2x^2 - 1$

Domain: $(-\infty, \infty)$

Range: $(-\infty, \infty)$