

1) Yes

2) No

3) No

4) a) $f(12) = \underline{3}$ b) $f(3) = \underline{0}$ c) $f(0) = \text{Undef.}$

c) If $f(x) = 7$, what is x ? $\underline{52}$

5) a) $f(0) = 3$ b) $f(-2) = 3/5$ c) $f(-1) = 1.5$

c) Can $f(x) = 3$? Yes, when $x=0$

6) Time is indep. Pop. is dep.

7) Indep. is weight, dep. is dosage in mg.

8) What is the independent variable? $\underline{\text{Population}}$

a) What is the dependent variable? $\underline{\text{Electoral Votes}}$

b) Using function notation, write a relationship between the variables p and v . $\underline{f(p) = v}$

DETERMINING WHETHER AN EQUATION IS A FUNCTION

- Algebraically
- Graphically (Vertical Line Test)

Is the equation a function? Use both methods above.

$$y^2 - x = 4$$

IMPLICIT AND EXPLICIT FORMS OF A FUNCTION

Implicit Form

$$5x + y = 2$$

$$xy = 1$$

$$x^2 + y = 4$$

Explicit Form

$$y = -5x + 2$$

$$\underline{y = 1/x}$$

$$\underline{y = 4 - x^2}$$

FINDING THE DOMAIN OF A FUNCTION

Use **set notation** and **interval notation** to express the domain.

$$1) f(x) = \frac{2}{x^2 - 9} \quad \{x \mid \text{All reals except } \pm 3\}, \{x \mid \text{All reals: } x \neq 3 \text{ and } x \neq -3\}$$
$$\{x \in \text{Reals: } x \neq 3 \text{ and } x \neq -3\} \quad (-\infty, -3) \cup (-3, 3) \cup (3, \infty)$$

$$2) g(x) = \sqrt{6 + 3x} \quad \{x \mid x \geq -2\}, [-2, \infty)$$

$$3) h(x) = \frac{x}{x^2 - 2x - 3} \quad \{x \mid \text{All reals except } 3 \text{ \& } -1\} \quad (-\infty, -1) \cup (-1, 3) \cup (3, \infty)$$

4) WHAT IS...

a) $f(4) = -2$

b) $g(7) = 7/32$

c) $h(1) = -1/5$

d) $g(x + 2) \quad g(x) = \sqrt{12 + 3x}$

GETTING INFORMATION ABOUT THE GRAPH OF A FUNCTION

- Algebraically
- Using the graphing calculator

Let $f(x) = \frac{5}{x^2 + 1}$.

a) Is the point $(2, 1)$ on the graph? Yes

b) What is $f(-2)$? $f(3)$? $f(0)$? 1, 1/2, 5

c) If $f(x) = 2.5$, what is x ? What point(s) is on the graph?
+/-1, (1, 2.5) (-1, 2.5)

d) If $f(x) = 6$, what is x ? Undefined

2.1 Functions and Problem Solving



- 1) **Gravity on Earth** - If a rock falls from a height of 80 feet on Earth, the height H (in feet) after t seconds is approximately

$$H(t) = -16t^2 + 80$$

- a) What is the height of the rock when $t = 0$ seconds? $t = 1$ second?
80 feet. 64 feet.
- b) When is the height of the rock 60 feet?
1.12 seconds
- c) When does the rock strike the ground?
2.24 seconds
- d) Draw a graph of this function using your calculator.
- 2) You have 100 meters of fencing material to fence in a rectangular yard for your dog.
- a) Write a function that you can use to describe the area of the yard as a function of x , its width.
 $x(100-x) = A(x)$
- b) Choose an appropriate window to graph this function.
- c) What dimensions would give the greatest area?
 $A(x) = -(x^2 - 100x) \Rightarrow A(x) = -(x-50)^2 + 2500$
Vertex(50,2500)