

Relations and Functions

Key Ideas:

1. Representing Relations and Functions

- arrow diagrams, tables of values, ordered pairs, words

2. Domain (x) and Range (y)

- look for boundary points

3. Functional Notation

- re-write "y" as " $f(x)$ "
- vertical line test

4. Rate of Change

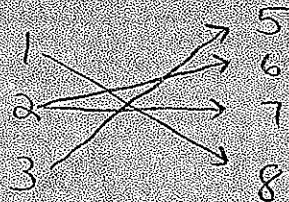
5. Interpreting Graphs

6. Slope

- label your points $(x_1, y_1), (x_2, y_2)$
- $m = \frac{\text{rise}}{\text{run}}$
- Slope formula
- Rate of Change

***Note: Watch your positive and negative signs!!**

1. a) Represent the following as an **arrow diagram**:
 $(1, 8), (2, 7), (2, 6), (3, 5)$



- b) Is this a **function**?

No

- c) State the **domain**:

$\{1, 2, 3\}$

- d) State the **range**:

$\{5, 6, 7, 8\}$

2. State the **domain** and **range** of: $y = -4x + 7$

D: $x \in \mathbb{R}$ R: $y \in \mathbb{R}$

3. Find $f(-4)$, given: $f(x) = x^2 - 10$

$$\begin{aligned} f(-4) &= (-4)^2 - 10 \\ &= 6 \end{aligned}$$

4. Given: $f(x) = 5x + 13$, **find** x when $f(x) = 3$

$$\begin{aligned} 3 &= 5x + 13 \\ -10 &= 5x \\ -2 &= x \end{aligned}$$

5. Identify the following as **linear** or **non-linear**:

a) $4x^2 + 3 = 6y$

non-linear

b) $5x - 2y = -8$

linear

c) $(2, 5), (6, 10), (10, 15)$

linear

6. Given: $C = 15t + 75$, where "C" is the cost of renting a hall and "t" is the number of tickets sold,

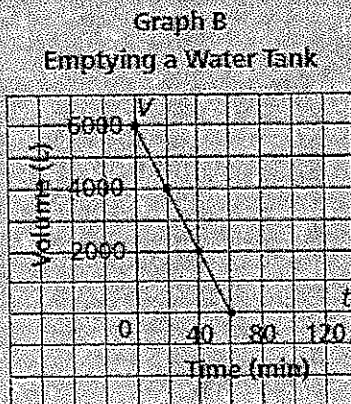
a) State the **rate of change**:

$$\$15 / \text{ticket}$$

b) Explain what the "+ 75" means:

base cost to rent the hall

7. State the **rate of change** for Graph B:



$$\frac{-5000}{60}$$

$$= \frac{-350}{3}$$

8. Determine the **slope** of $A(-1, 4)$ and $B(3, -8)$:

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{-8 - 4}{3 - (-1)}$$

$$= -3$$