# 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 $(x_1, y_1), (x_2, y_2)$**
    - $m = \dfrac{rise}{run}$
    - **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**?

   c) State the **domain**.

   d) State the **range**.

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

3. Evaluate $f(-4)$ if $f(x) = x^2 - 10$.

4. Given $f(x) = 5x + 13$, determine the value of $x$ when $f(x) = 3$.

5. Identify the following as *linear* or *non-linear*.
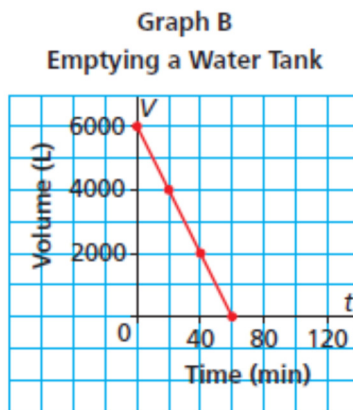
   a) $4x^2 + 3 = 6y$       b)   $5x - 2y = -8$       c)  $(2, 5), (6, 10), (10, 15)$

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*.

   b) explain what the " $+ 75$" represents.

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

**Graph B**
**Emptying a Water Tank**



8. Determine the *slope* of a line passing through the points, $A(-1, 4)$ and $B(3, -8)$.