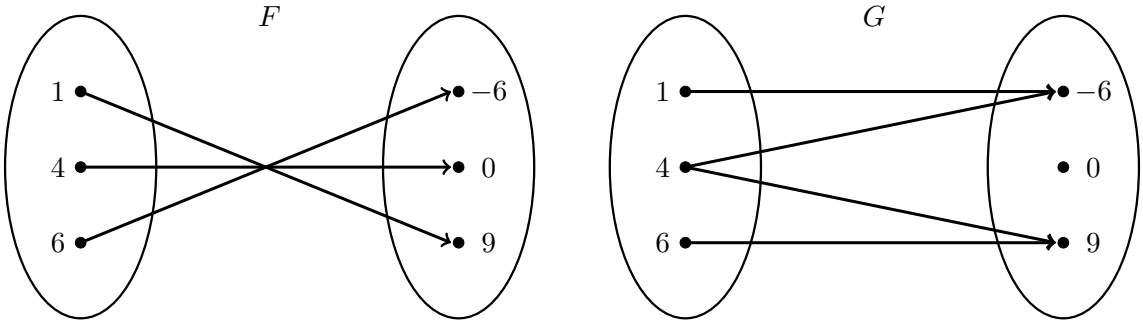
**Name:** _____
**MATH 108**
**Fall 2021**
**HW 1: Due 09/28**

*"Clark Kent is Superman's critique on the whole human race."*
*–Bill, Kill Bill*

**Problem 1.** (10pt) Two relations, $F$ and $G$, are represented below. Are either $F$ or $G$ functions? Explain.



**Problem 2.** (10pt) Given the following tables, do $f(x)$ and $g(x)$ represent functions? Explain.

| $x$ | $f(x)$ |
|---|---|
| 1 | 3 |
| 2 | 6 |
| 3 | 9 |
| 4 | 2 |
| 5 | 5 |

| $x$ | $g(x)$ |
|---|---|
| 1 | 4 |
| 2 | 1 |
| 3 | 4 |
| 4 | 5 |
| 1 | 3 |

**Problem 3.** (10pt) Does the formula $f(x) := 2.31x + 9.55$ give a function? Explain. If it is a function, describe its graph.

**Problem 4.** (10pt) For each of the following, indicate whether the equation is a linear equation (T), or not (F).

(a) _____: $2x - 3y = 9$

(b) _____: $2x^2 + 5y^2 = 7$

(c) _____: $x = 5$

(d) _____: $x = 6 - y$

(e) _____: $y = x^2 + x + 1$

**Problem 5.** (10pt) For each of the following, indicate whether the function is linear (T), or not (F).

(a) _____: $y = 2x + 1$

(b) _____: $f(x) = 1 - 6x$

(c) _____: $y = x(2x + 1)$

(d) _____: $y = 2(x - 1)$

(e) _____: $f(x) = \frac{1}{3}x - 9$

**Problem 6.** (10pt) Given the data in the table below, is it reasonable to say that the data is linear? Explain.

| $x$ | $f(x)$ |
|---|---|
| 1 | 4 |
| 2 | 6 |
| 3 | 8 |
| 4 | 10 |
| 6 | 12 |

**Problem 7.** (10pt) Complete the following parts:

(a) Find the equation of the line through the points $(1, -5)$ and $(-2, 13)$.

(b) What is the slope and $y$-intercept of the line from (a)?

(c) Sketch the line from (a) as accurately as possible.

**Problem 8.** (10pt) Consider the line given by $f(x) = 6x + 5$.

(a) Find the $y$-intercept for this line.

(b) Find the $x$-intercept for this line.

(c) Is the point $(0, 1)$ on the line? Explain.

(d) Is the point $(-1, -1)$ on the line? Explain.