

**Due: Aug. 08, 2023**

1. Write the following in set notation:
  - a) The set of all real numbers less than 5.
  - b) The set of all real numbers greater than 8, but less than 73.
2. Given the sets:  $S_1 = \{2, 4, 6\}$ ,  $S_2 = \{7, 2, 6\}$ ,  $S_3 = \{4, 2, 6\}$  and  $S_4 = \{2, 4\}$ , find
  - a)  $S_1 \cup S_3$
  - b)  $S_2 \cap S_4$
  - c)  $S_3 \cup S_1 \cup S_4$
  - d)  $S_1 \cap S_3 \cap S_4$
3. Enumerate all of the subsets of the set  $\{1, 7, 13\}$ .
4. If the *domain* for the function  $y = 10 - 4x$  is the set  $\{x \mid -2 \leq x \leq 3\}$  find the *range* of the function and express it as a set.
5. If the *domain* for the function  $y = 3x$  is the set  $\{x \mid x \geq 3\}$  find the *range* of the function and express it as a set.
6. For the function  $y = -x^2$ , if the domain is the set of all nonnegative real numbers, what will its range be?
7. Graph the following functions:
  - a)  $y = 8 + 3x$
  - b)  $y = 8 - 3x$
  - c)  $y = 3x + 12$
  - d)  $y = 4$
  - e)  $y = x$
  - f)  $y = x^2$
8. Identify the vertical intercept and the slope for the following functions:
  - a)  $y = 14 + 6x$
  - b)  $y = -2 - 6x$
  - c)  $y = x$
  - d)  $y = 2$
9. Simplify the following expressions:

a)  $x^2 \times x^8$

b)  $x^2 \times x^3 \times x^4$

c)  $x^3 \times y^3 \times z^3$

d)  $(x^4)^5$

e)  $(x^a)^3$

f)  $x^{-2}$

g)  $\frac{x^3}{x^{-3}}$

h)  $\frac{x^{1/2} \times x^{1/3}}{x^{2/3}}$

i)  $\frac{x^4}{x^3}$

j)  $\frac{(x^{1/3})^3}{x^{1/3}}$