

MAT 147
Homework # 1

1. Write the following sets using the “roster method”. That is, write the sets in list form.

- (a) $A = \{x \in \mathbb{N} : -13 \leq x \leq 5\}$
- (b) $B = \{x \in \mathbb{N} : x \text{ appears in the decimal expansion of } 375/999\}$
- (c) $C = \{x : x \text{ is the name in English of a month of the year}\}$
- (d) $D = \{x : x \text{ is a prime number divisible by } 2\}$
- (e) $E = \{x : x \text{ is an integer less than } 1\}$

2. List the next three elements in each of the following sets.

- (a) $\{1, \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \dots\}$
- (b) $\{1, 2, 3, 5, 8, 13, \dots\}$
- (c) $\{-1, 3, -9, 27, \dots\}$

3. Given the following sets, answer either true or false to each of the statements (a) - (h).

$$A = \{4, 8, 12, \dots, 96, 100\} \quad B = \{-1, 0, 1, 2, 3, 4, 5, 6\} \quad C = \emptyset$$

$$D = (-\infty, -7] \quad E = [-1, 6] \quad F = (-1, \infty)$$

- (a) $-7 \in D$
- (b) $B \subset E$
- (c) $0 \in A$
- (d) $-1 \in F$
- (e) $0 \in C$
- (f) $C \subset A$
- (g) $\{8\} \in A$
- (h) $E \subset F$

4. The **power set** of a given set A is the set of all subsets of A , and is denoted by $\mathcal{P}(A)$. Find the set $\mathcal{P}(\{\emptyset, \{\emptyset\}\})$.