

Section 4.1

#2, 13, 32

$$\#2 \quad B = \{x \mid x \in \mathbb{Q} \wedge -1 < x < 2\}$$

(= rational numbers between -1 + 2,
not-inclusive)

a. $0 \in B$?

✓

b. $-1 \in B$?

✗

(non-inclusive)

c. $-0.84 \in B$?

✓

(terminating decimal)

d. $\sqrt{2} \in B$?

✗

(irrational)

#13

$$R = \{1, 3, \pi, 4, 1, 9, 10\}$$

$$S = \{\{1\}, 3, 9, 10\}$$

$$T = \{1, 3, \pi\}$$

$$U = \{\{1, 3, \pi\}, 1\}$$

a. $S \subseteq R$ No $\{1\} \notin R$

b. $1 \in R$ ✓

c. $1 \in S$ No $\{1\} \in S$

d. $1 \subseteq U$ No $\{1\} \subseteq U$

e. $\{1\} \in T$ ✓

f. $\{1\} \subseteq S$ No $\{\{1\}\} \subseteq S$

g. $T \subseteq R$ No $T \in U$

#32 Find $P(P(S))$ where $S = \{a, b\}$.

The power set of S will have $2^2 = 4$ elements:

$$P(S) = \{ \emptyset, \{a\}, \{b\}, S \}$$

The power set of $P(S)$ will have

$2^4 = 16$ elements:

$$\left\{ \emptyset, \{ \emptyset \}, \{ \{a\} \}, \{ \{b\} \}, \{ \emptyset, \{a\} \}, \{ \emptyset, \{b\} \}, \{ \{a\}, \{b\} \}, \{ \emptyset, S \}, \{ \{a\}, S \}, \{ \{b\}, S \}, \{ \emptyset, \{a\}, \{b\} \}, \{ \emptyset, \{b\}, S \}, \{ \emptyset, \{a\}, S \}, \{ \{a\}, \{b\}, S \}, P(S) \right\}$$