

9. $B = \{3x \mid x \text{ is whole number}\}$

$$B = \{3x \mid x \text{ is } 0, 1, 2, 3, \dots\}$$

$$3(0) = 0$$

$$3(1) = 3$$

$$3(2) = 6$$

$$3(3) = 9$$

$$B = \{\text{multiples of } 3\}$$

$$B = \{0, 3, 6, 9, \dots\}$$

11. $\sqrt{9} = 3$

The number 3 belongs to the set of Natural, Whole, Integer, Rational, Real and Complex numbers.

13. All the subsets of $D = \{a, b\}$ are:

$$\{ \}, \{a\}, \{b\}, \{a, b\}$$

15. $X = \{5, 6, 7, 8\}$, $Y = \{1, 2, 3, 4, 5\}$

$$\text{Find } X \cap Y.$$

Find all the elements in both X and Y.

The only element in both X and Y is 5.

$$X \cap Y = \{5\}$$

$$\text{Find } X \cup Y.$$

Find all the elements in X or Y.

$$X \cup Y = \{1, 2, 3, 4, 5, 6, 7, 8\}$$

17. $A = \{w, x, y, z\}$, $B = \{w, x\}$,

$$\text{Find } A \cap B.$$

Find all elements in both A and B.

$$A \cap B = \{w, x\}$$

$$\text{Find } A \cup B.$$

Find all elements in A or B.

$$A \cup B = \{w, x, y, z\}$$

19. $A = \{\text{house, car, electric, phone}\}$,

$$B = \{\text{car, phone, water}\}$$

$$\text{Find } A \cap B.$$

Find all elements in A and B.

$$A \cap B = \{\text{car, phone}\}$$

$$\text{Find } A \cup B.$$

Find all elements in A or B.

$$A \cup B = \{\text{house, car, electric, phone, water}\}$$

21. $X = \{10, 12, 14, 16\}$,

$$Y = \{8, 9, 10, 11, 12\}$$

$$\text{Find } X \cap Y.$$

Find all elements in X and Y.

$$X \cap Y = \{10, 12\}$$

$$\text{Find } X \cup Y$$

Find all elements in X or Y.

$$X \cup Y = \{8, 9, 10, 11, 12, 14, 16\}$$

23. $A = \{3x \mid x \in N\}$

$$A = \{3x \mid x = 1, 2, 3, \dots\}$$

$$3(1) = 3$$

$$3(2) = 6$$

$$3(3) = 9$$

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$$A = \{3, 6, 9, \dots\}$$

25. $D = \{5x \mid x \in \mathbb{Z}\}$

$$D = \{5x \mid x = \dots -2, -1, 0, 1, 2, \dots\}$$

$$5(-2) = -10$$

$$5(-1) = -5$$

$$5(0) = 0$$

$$5(1) = 5$$

$$5(2) = 10$$

$$D = \dots -10, -5, 0, 5, 10, \dots\}$$

27. $F = \{2x \mid x = 0, 1, 2, 3\}$

$$2(0) = 0$$

$$2(1) = 2$$

$$2(2) = 4$$

$$2(3) = 6$$

$$F = \{0, 2, 4, 6\}$$

29. $Y = \{2x + 1 \mid x = 1, 2, 3, 4\}$

$$2(1) + 1 = 3$$

$$2(2) + 1 = 5$$

$$2(3) + 1 = 7$$

$$2(4) + 1 = 9$$

$$Y = \{3, 5, 7, 9\}$$

31. $\{1, 3, 5, 7, 9, \dots\}$

This is the set odd numbers.

Each is one more than a multiple of two.

$$\{2x + 1 \mid x \in \text{whole numbers}\}$$

The Whole numbers start with zero, so

$2(0) + 1$ produces 1 which is the first element in the set.

Another possible answer is:

$$\{2x - 1 \mid x \in \mathbb{N}\}$$

The Natural numbers start with one, so

$2(1) - 1$ produces 1 which is the first element in the set.

33. $\{\dots, -3, -2, -1, 0, 1, 2, 3, \dots\}$

These numbers are all the Integers, so the set is:

$$\{x \mid x \in \text{integers}\}$$

35. $\{0, 2, 4, 6\}$

These numbers are multiples of two.

$$2(0) = 0, 2(1) = 2, 2(2) = 4, 2(3) = 6$$

The set is:

$$\{2x \mid x = 0, 1, 2, 3\}$$

37. $\{3, 4, 5\}$

These numbers are a sequence in the Natural numbers, so the set is:

$$\{x \mid x = 3, 4, 5\}$$

39. $\{-3, -2, -1\}$

These numbers are a sequence in the Integers, so the set is:

$$\{x \mid x = -3, -2, -1\}$$

41. $\{-4, -3, -2\}$

These numbers are a sequence in the Integers, so the set is:

$$\{x \mid x = -4, -3, -2\}$$

43. $\{-1, 0, 1, 2, 3\}$

These numbers are a sequence in the Integers, so the set is:

$$\{x \mid -1 \leq x \leq 3 \quad x \in \mathbb{Z}\}$$

or

$$\{x \mid x = -1, 0, 1, 2, 3\}$$