

Solutions

Page 8 #s 1aceg, 2, 4, 5be, 6, 7, 8, 9

Page 9 #s 10, 16, 17, 21

1. State the number of elements (or members) in each set.

a) {blue, green, red, yellow}

c) {Ontario, Alberta, Manitoba}

g) {0}

e) {-9, -8, -7}

a) 4

c) 3

g) 1

e) 3

2. Explain why the set $\{7,9,12\}$ is a subset of the set $\{5,6,7,8,9,10,11,12\}$.

Because 7, 9, and 12 are elements of the set $\{5, 6, 7, 8, 9, 10, 11, 12\}$

4. Match each parent set on the left with its corresponding subset on the right.

a) $\{-8, -7, -6, -5, -4, -3, -2, -1\}$

i) $\{1, 3, 5, 7, 9\}$

b) $\{-8, -6, -4, -2, 0, 2, 4, 6, 8, \dots\}$

ii) $\{-13\}$

c) $\{1, 2, 3, 4, 5, \dots\}$

iii) $\{0, 2, 4, 6, 8, \dots\}$

d) $\{\dots, -9, -7, -5, -3, -1\}$

iv) $\{-1, -2, -3\}$

a) \longrightarrow (iv)

b) \longrightarrow (iii)

c) \longrightarrow (i)

d) \longrightarrow (ii)

5. Express the following sets in braces, { }.

e) The set of all even whole numbers greater than or equal to 20.

b) The set of odd integers from -5 to 5.

$$b) \{-5, -3, -1, 1, 3, 5\}$$

$$e) \{20, 22, 24, 26, 28, \dots\}$$

includes 20

6. List all of the subsets of the set {1,2}.

$$\{1\}$$

$$\{2\}$$

7. List all of the subsets of the set $\{-1, 0, 1\}$.

$\{-1\}$ $\{0\}$ $\{1\}$

$\{-1, 0\}$ $\{-1, 1\}$ $\{0, 1\}$

8. Identify each of the following statements as true or false.

- a) The set of whole numbers is a subset of the set of real numbers. **T**
- b) The set of natural numbers is a subset of the set of integers. **T**
- c) The set of whole numbers is a subset of the set of natural numbers. **F**
- d) The set of rational numbers is a subset of the set of real numbers. **T**
- e) The set of irrational numbers is a subset of the set of rational numbers. **F**
- f) The set of prime numbers is a subset of the set of rational numbers. **T**
- g) $\{2, 3, \pi\}$ is a subset of the rational numbers. **F**

c) 0 is not a natural number

e) Numbers are irrational OR rational
They can't be both.

g) π is irrational

9. Jonah stated that subsets always have fewer elements than their parent sets. Is Jonah's claim correct? Explain.

Jonah is correct. A subset is a part of their parent set.

10. Aaliyah claims that the sets $\{3,4,5\}$ and $\{4,5,3\}$ are the same. Is Aaliyah's claim true? Explain.

Aaliyah's claim is correct.
Both sets have the same elements in them.

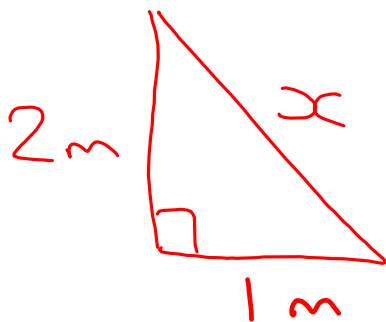
16. Describe a real-life situation in which you might encounter an irrational number.

Many answers to this, but most likely when calculating the area or circumference of a circle.

$$A = \pi r^2 \quad C = 2\pi r$$

Also you could have a question using the Pythagorean theorem.

17. Create a problem for which the answer involves the irrational number $\sqrt{5}$.



How long is the ladder?

$$c^2 = a^2 + b^2$$

$$x^2 = 1^2 + 2^2$$

$$x^2 = 1 + 4$$

$$x^2 = 5$$

$$x = \sqrt{5} \text{ m}$$

21. The symbol \subseteq is often used to denote a subset. For example, if set P is a subset of set Q , we would write $P \subseteq Q$. If $A = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$, $B = \{2, 4, 6, 8\}$ and $C = \{4, 8\}$, indicate whether each of the following statements is true or false.

a) $A \subseteq B$

b) $B \subseteq A$

c) $C \subseteq B$

d) $C \subseteq A$

e) $B \subseteq C$

False True True True False