

King Fahd University of Petroleum and Minerals
Prep-Year Math Program
Math (001)-Term (141)
Recitation (R1 and R2)
Answered by Sayed Omar

Question 1: Given the following numbers:

$-1, 0, 1, 2, 91, 2.12122123\dots, \frac{22}{7}, -41, 2.2\bar{3}, \pi, \frac{\sqrt{2}}{3}, \frac{\sqrt{81}}{3}, 3.14, 111$

Complete the following:

Integers: _____

Rational Numbers: _____

Irrational Numbers: _____

Answer:

Integers: $-1, 0, 1, 2, 91, -41, \frac{\sqrt{81}}{3}, 111$

Rational Numbers: $-1, 0, 1, 2, 91, \frac{22}{7}, -41, 2.2\bar{3}, \frac{\sqrt{81}}{3}, 3.14, 111$

Irrational Numbers: $2.12122123\dots, \pi, \frac{\sqrt{2}}{3}$

Question 2:

Let U be the universal set, where: $U = \{x \mid x \text{ is a whole number less than } 11\}$ and

$A = \{x \mid x \text{ is an even natural number } \leq 8\}$

$B = \{2, 4, 5, 8, 10\}$

$C = \{1, 2, 4, 5, 7, 8\}$

Answer the following as **TRUE** or **FALSE**?

a) $A' = \{0, 1, 3, 5, 7, 9, 10\}$

b) $\{0\} \subseteq A$

c) $A \cup B' = \{0, 1, 2, 5, 6\}$

d) $\emptyset \in U$

e) $\emptyset \subseteq U$

Answer:

a) $A' = \{0, 1, 3, 5, 7, 9, 10\}$ **TRUE**

b) $\{0\} \subseteq A$ **FALSE**

c) $A \cup B' = \{0, 1, 2, 5, 6\}$ **FALSE**

d) $\emptyset \in U$ **FALSE**

e) $\emptyset \subseteq U$ **TRUE**

Question 3:

If $x = 3 \cdot 4^2 + |-7| - 3^4 \div 9$, $y = 35 - 20 \div 5 \times 2 - 6 \times 3$ and $z = 6 - 4 \div 2 + 45$,

then find the value of the expression: $x - 2[y \div (z - x)]$

Answer: $x = 46$, $y = 9$, $z = 49$

$$x - 2[y \div (z - x)] = 40$$

Question 4: TRUE or FALSE

- 1) The operation of division of real numbers is associative. **FALSE**
- 2) $\frac{4x + 6y}{2} = \frac{1}{2}(4x + 6y) = 2x + 3y$ illustrates the distributive property. **TRUE**
- 3) If x is any real number, then $|-x| = x$. **FALSE**
- 4) $6 + (2 + 3) = (2 + 3) + 6$ illustrates the associative property of addition. **FALSE**
- 5) Any integer number is either positive or negative. **FALSE**
- 6) The division of real numbers is closed. **FALSE**

Question 5:

If $x < 0$, then $|x| + |-x| + ||x|| =$

- | | | |
|---------|----------|--------|
| A) $3x$ | B) $-2x$ | C) x |
| D) $-x$ | E) $-3x$ | |

Answer: E: $|x| + |-x| + ||x|| = -3x$

Question 6: Let $A = \{y \mid y = x - |x|\}$, where x is an integer $-4 < x \leq 0$ and

$B = \{-6, -4, -2, -1, 0\}$, then $A \cap B =$

- | | | |
|-----------------|-------------|--------------------------------|
| A) $\{-4, -2\}$ | B) A | C) \emptyset (the empty set) |
| D) $A \cup B$ | E) B | |

Answer: B: $A \cap B = \{-6, -4, -2, 0\} = A$