

King Fahd University of Petroleum and Minerals  
 Mathematical Sciences Department  
 Math 001  
 Quiz# 1  
 Term(061)

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Student's Name: ..... ID: ..... SEC: ...

1) Determine which of the numbers

$-2, -1, \frac{-1}{4}, 0, 3, 5, 6.23\dots, \sqrt{7}, 12, 1.20220222, \sqrt{16}, 2.212121\dots, \frac{2\sqrt{8}}{\sqrt{2}}, 2\pi-3, -2\frac{1}{3}, 1$  is/ are

(a) Whole numbers:  $3, 5, 12, \sqrt{16}, 1$

(a) Rational numbers:  $-2, -1, -\frac{1}{4}, 0, 3, 5, \sqrt{16}, 12, 1.20220222, \frac{2\sqrt{8}}{\sqrt{2}}, -2\frac{1}{3}, 1, 2.21$

(b) Prime numbers:  $3, 5$

(c) Irrational numbers:  $6.23\dots, \sqrt{7}, 2\pi-3$

(d) Composite numbers:  $\sqrt{16}$

(e) Real number:  $ALL$

2) Identify the property of real numbers or equality that is illustrated by each of the following statements:

(a)  $4 + (-4) = 0$  ...by  $additive\ inverse$

(b)  $-3(x + 5y) = -3x - 15y$  ...by  $Distribution$

3) Given the following three sets  $A = \{x \mid x \text{ is a nonnegative integer and } -7 \leq x < 5\}$ ,

$B = \{x \mid x \text{ is a composite number less than } 10\}$  and

$C = \{x \mid x = 2t + 1, t \text{ is a natural number less than } 4\}$ .

(a) List all elements of  $A = \{0, 1, 2, 3, 4\}$

(b) List all elements of  $B = \{4, 6, 8, 9\}$

(c) List all elements of  $C = \{3, 5, 7\}$

(d) List all elements of  $(A \cap B) \cup C = \{4\} \cup C = \{3, 4, 5, 7\}$

4) Write the expression  $|2m - 3| - |1 - 2m|$ , if  $m > 3$  without the absolute value symbols.

$2m - 3 > 0$  if  $m > 3$  &  $1 - 2m < 0$  if  $m > 3$   
 $\Rightarrow |2m - 3| - |1 - 2m| = 2m - 3 - (-(1 - 2m))$   
 $= 2m - 3 + 1 - 2m = -2$

5) Express the following statements using the absolute value notation.

(a) "The distance between  $-3$  and  $3t$  is equal to  $3$ " ...  $| -3 - 3t | = 3$

or  $| 3t + 3 | = 3$

(b) "x is closer to 2 than it is from 4"

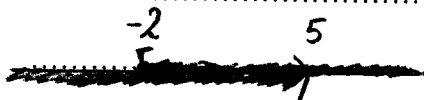
$$|x-2| < |x-4|$$

6) Given the following set, sketch its graph and write it in interval notation:

$$\{x|x \geq -2 \text{ and } x < 5\}$$

Graph:

Interval notation:



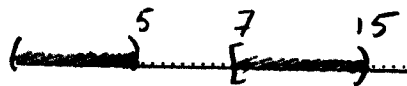
$$[-2, 5)$$

7) Given the following interval, sketch its graph and write it in set builder form:

$$(-\infty, 5) \cup [7, 15)$$

Graph:

Set builder form:



$$\{x | -\infty < x < 5 \text{ or } 7 \leq x < 15\}$$