KING FAHD UNIVERSITY OF PETROLUEM AND MINERALS

Math 001– Term 041

Quez#1

Name: ID#: Sec#: 3 & 9 & 15 Sr#:

Q1: Which of the following statements True and which is False, State the reason:

1. $1.7+\sqrt{3}$ is a rational number. **(FALSE)**, because $\sqrt{3}$ is an irrational
2. The set $A=\{0,1,2,3,...,10\}$ is closed under multiplication. **(FALSE),** because $10\in A \ and \ 10*10=100\notin A$
3. $-6\frac{2}{5}$ is the multiplicative inverse of $\frac{5}{32}$.**(FALSE)**, because $-6\frac{2}{5}=-\frac{32}{5}$ and $-\frac{32}{5}.\frac{5}{32}=-1\neq 1$
4. $|-x|=x$ **(FALSE)**, because $|-x|=-x$, let $x=-5, \ |-(-5)|=|5|=5=-x\neq x$
5. If $y=x+1$ and $z=y^2$ *then* $z=(x+1)^2$, this statement is **TRUE** because of the transitive property of equality.**(FALSE)**, because of the substitution property of equality.

Q2: Name the property of real number or the property equality of the following:

1. $(a+b)+c=c+(a+b)$ Answer: **Commutative prop. of addition.**
2. $(4.x).y=y.(4.x)$ Answer: **Commutative prop. of multiplication.**
3. $\left(4.\frac{1}{4}\right)w=1.w$ Answer: **Inverse of multiplication.**
4. $(-7)+7=0$ Answer: **Inverse property of addition.**
5. $(x+3)2=2x+6$ Answer: **Distributive property.**

Q3: If $A=\{x \mid x \text{ is composite number less than } 13\}$

$B=\{x \mid x \text{ an even number and } 0\le x<12\}$

$C=\{x \mid x \text{ is a prime number less than } 15\}$

1. list $A=\{4,6,8,9,10,12\}$

   $B=\{0,2,4,6,8,10\}$

   $C=\{2,3,5,7,11,13\}$

2. find $(A\cap B)\cup C=$

$(A\cap B)=\{4,6,8,10\}$

$(A\cap B)\cup C=\{2,3,4,5,6,7,8,10,11,13\}$

Q4:a) Simplify

$$\left(-\frac{8}{27}\right)^{2/3}(-32)^{-3/5}=\left(-\frac{2^3}{3^3}\right)^{2/3}\left(-2^5\right)^{-3/5}$$

$$=\left(-\frac{2}{3}\right)^2(-2)^3$$

$$=\left(\frac{4}{9}\right)\left(-\frac{1}{8}\right)$$

$$=-\frac{1}{18}$$

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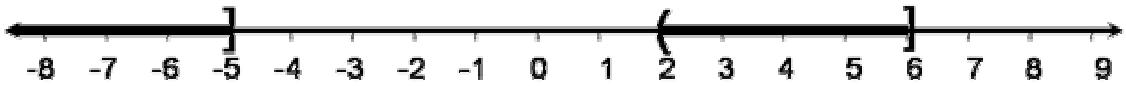
b) Given the inequality $x \le -5 \text{ or } 2 < x \le 6$

1. Graph the given inequality on a real line



2. Write the given inequality as an interval notation

$$(-\infty,-5]\cup(2,6]$$

Q5: write the following expression without the absolute value notation:

$$\left|\frac{\left|x-\frac{1}{4}\right|}{\left|x-\frac{1}{8}\right|+\left|x+\frac{1}{8}\right|}\right|,\ 0<x<\frac{1}{8}$$

$$\left|\frac{\left|x-\frac{1}{4}\right|}{\left|x-\frac{1}{8}\right|+\left|x+\frac{1}{8}\right|}\right|=\frac{\left\|x-\frac{1}{4}\right\|}{\left\|x-\frac{1}{8}\right\|+\left|x+\frac{1}{8}\right\|}=\frac{\left|\frac{1}{4}-x\right|}{\left|\frac{1}{8}-x+x+\frac{1}{8}\right|}$$

$$=\frac{\frac{1}{4}-x}{\left|\frac{2}{8}\right|}=4\left(\frac{1}{4}-x\right)=1-4x$$

Q6: Simplify

$$4\sqrt[3]{72}-\frac{10}{\sqrt[3]{81}}=4\sqrt[3]{3^2 2^3}-\frac{10}{\sqrt[3]{3^3 3}}=4\sqrt[3]{3^2 2^3}-\left(\frac{10}{3\sqrt[3]{3}}\frac{\sqrt[3]{3^2}}{\sqrt[3]{3^2}}\right)=8\sqrt[3]{3^2}-\frac{10\sqrt[3]{3^2}}{3\sqrt[3]{3^3}}$$

$$=8\sqrt[3]{3^2}-\frac{10\sqrt[3]{3^2}}{9}=\frac{62\sqrt[3]{3^2}}{9}=\frac{62\sqrt[3]{9}}{9}$$