King Fahd University of Petroleum and Minerals
College of Science
Mathematical Sciences Department
Preparatory Year Mathematics Program (061)
Quiz # 2

Sample Solution

Instructor: Al-Absi, Bassam — **Show All Necessary Steps**

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

(1) The equation $2\sqrt{x}-1=\sqrt{2-\sqrt{x}}$ has: ①

$(2\sqrt{x}-1)^2=(\sqrt{2-\sqrt{x}})^2$

$\Rightarrow 4x-4\sqrt{x}+1=2-\sqrt{x}$

$\Rightarrow (4x-1)^2=(3\sqrt{x})^2$

$\Rightarrow 16x^2-8x+1=9x$

$\Rightarrow 16x^2-17x+1=0$

$\Rightarrow (16x-1)(x-1)=0$

$\Rightarrow x=\frac{1}{16}$ or $x=1$

as proposed sol^{ns}

Upon checking in Eq ①, $x=1$ is the only sol^{n}.

a) No real solutions

b) One real solution only ✓

c) Two real solutions

d) One real solution and one nonreal solution

e) Two nonreal solutions

(2) When solving $a=\frac{2bc}{b-c}$ for c we obtain $c=$

a) $\frac{ab}{a+2b}$ ✓

b) $\frac{a}{a-2b}$

c) $\frac{a-2b}{ab}$

d) $\frac{2ab}{a+b}$

e) $\frac{a+b}{2ab}$

L.C.D $=b-c$

$\Rightarrow (b-c)\cdot a=(b-c)\cdot\frac{2bc}{b-c}$, $b-c\neq 0$

$\Rightarrow ab-ac=2bc$

$\Rightarrow 2bc+ac=ab$

$\Rightarrow c(2b+a)=ab$

$\Rightarrow c=\frac{ab}{2b+a}$

(3) The solution set of the equation $\frac{3x}{x+1}=2-\frac{6}{2x+2}$

$\Rightarrow (x+1)\cdot\frac{3x}{x+1}=(x+1)\cdot 2-(x+1)\cdot\frac{6}{2(x+1)}$

$x \neq -1$

$\Rightarrow \quad 3x = 2x+2-3$

$\Rightarrow \quad \boxed{x=-1}$

which is rejected

a) contains one positive integer onle

b) contains one negative integer only

c) is equal to the set of all real numbers

d) is equal to the empty set

e) contains a positive integer and a negative integer

(4) The sum of all nonreal solutions of the equation $8x^3-27=0$ is:

a) 2

b) −5

c) 0

d) 4

e) $\frac{3}{2}$

$(2x-3)\cdot(4x^2+6x+9)=0$

$x=\frac{3}{2}$, $4x^2+6x+9=0$

$\Rightarrow$ the sum of the nonreal solutions is $\frac{-b}{a}=\frac{-6}{4}=-\frac{3}{2}$