QATAR UNIVERSITY

FOUNDATION PROGRAM – MATHEMATICS

QUIZ #4 — Version 3

Instructor : Muhammad A. Shaikh

Subject: Math-3

Student Name : _____ Section: _____

Problem #1

Solve the given equations

Each part carries 6 marks

a) $\frac{2}{y}+\frac{5}{2}=4-\frac{2}{3y}$ LCD = $6y$

$\frac{2}{y}\cdot 6y + \frac{5}{2}\cdot 6y = 4\cdot 6y - \frac{2}{3y}\cdot 6y$

$12 + 15y = 24y - 4$

$-9y = -16$

$\boxed{y = 16/9}$

b) $\sqrt{2x-1}-\sqrt{x-5}=3$

$\sqrt{2x-1} = 3+\sqrt{x-5}$ square both sides $2x-1 = 9+(x-5)+6\sqrt{x-5}$

$2x-1-9-x+5 = 6\sqrt{x-5} \Rightarrow x-5 = 6\sqrt{x-5}$

let $\sqrt{x-5} = t \Rightarrow (x-5) = t^2 \Rightarrow t^2 = 6t$

$t^2 - 6t = 0 \Rightarrow t(t-6) = 0 \Rightarrow t = 0,\ t = 6$

$\sqrt{x-5} = 0 \Rightarrow \boxed{x = 5}$ $\sqrt{x-5} = 6 \Rightarrow x-5 = 36 \Rightarrow \boxed{x = 41}$

c) $3y^{2/3}+2y^{1/3}+2=0$ Let $y^{1/3} = t \Rightarrow y^{2/3} = t^2$

$3t^2+2t+2 = 0$ $t = \frac{-2 \pm \sqrt{4-24}}{2} = \frac{-2 \pm \sqrt{-20}}{2}$

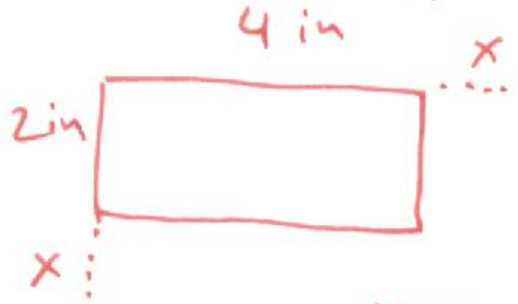
not a real solution

Problem #2

Solve the given word problems

Each part carries 6 marks

a) If the length and the width of a 4- by 2-inch rectangle are each increased by the same amount, the area of the new rectangle will exceed the original area by 7 sq inches (new area is 7 sq inches more than the original area). What are the dimensions of the new rectangle?



oldArea = $4 \times 2 = 8$ sq in

NewArea = $(4+x)(2+x)$

New area = old area + 7

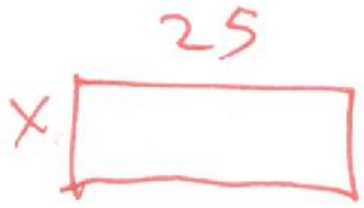
$(4+x)(2+x) = 8+7$

$x^2+6x+8 = 15 \Rightarrow x^2+6x-7=0$

$(x+7)(x-1)=0$ $\quad x=-7$ & $x=1$ ✓

$5_{in} \times 3_{in}$

b) A rectangle 25 cm long has the same area as a triangle with a base of 10 cm and the height of 20 cm. Find the perimeter of the rectangle.



$A_{rectangle} = A_{triangle}$

$25x = \frac{1}{2}(20)(10)$

$25x = 100$

$x = 4$

$P = 2(x+25)$

$= 2(4+25)$

$= 58$ cm