

QUIZ # 3 (B)

1) Find all positive rational solutions of $(x+1)^{2/3} - 2(x+1)^{1/3} - 3 = 0$

$$(x+1)^{2/3} - 2(x+1)^{1/3} - 3 = 0$$

$$y = (x+1)^{1/3}$$

$$y^2 - 2y - 3 = 0$$

$$(y-3)(y+1) = 0$$

$$y = 3 \quad \text{or} \quad y = -1$$

$$(x+1)^{1/3} = 3 \quad \text{or} \quad (x+1)^{1/3} = -1$$

$$(x+1) = 27 \quad \quad \quad x+1 = -1$$

$x+1 = 27$ or $x = -2$
 $x = 26$
 SS = $\{-2, 26\}$
 The positive rational
 solⁿ is $\boxed{26}$

2) If $x=k$ is the solution of $5 = -3x + \sqrt{5+3x}$. Find the value of $3+5k$

$$5 + 3x = \sqrt{5+3x}$$

$$25 + 30x + 9x^2 = 5 + 3x$$

$$9x^2 + 27x + 20 = 0$$

$$(3x + 5)(3x + 4) = 0$$

$$x = -5/3 \quad \quad x = -4/3$$

Check
 $x = -5/3$

$$5 = -3(-5/3) + \sqrt{5+3(-5/3)}$$

$$5 = 5 + \sqrt{0} \quad \checkmark$$

$$x = -4/3 \quad 3+2k = 3 + (-8/3) = \boxed{1/3}$$

$$5 = -3(-4/3) + \sqrt{5+3(-4/3)}$$

$$= 4 + 1 = 5 \quad \checkmark$$

$$3+2k = 3 - 10/3 = \boxed{-1/3}$$

3) Solve the inequality the compound inequality
 $|2x-1| \leq 3$ and $x^2 \geq -2x$

$$-3 \leq (2x-1) \leq 3$$

$$-2 \leq 2x \leq 4$$

$$-1 \leq x \leq 2$$

$$x^2 + 2x \geq 0$$

$$x(x+2) \geq 0$$

	-2	0	
x	-	+	+
x+2	-	0	+
	+	-	+

$$(-\infty, -2] \cup [0, \infty)$$

$$SS = [-1, 2] \cap ((-\infty, -2] \cup [0, \infty))$$

$$SS = \boxed{[0, 2]}$$