ANSWERS to 50-pt-QUIZ #2 (on Chapter 1)

1. $\dfrac{a + c}{b + c} = 9$ Clear the fractions, by multiplying through by b+c

$a + c = 9b + 9c$ Simplify: subtract c, and also 9b from both sides.

$a - 9b = 8c$

$\dfrac{a - 9b}{8} = c$

2. Solve using the quadratic formula (after expressing as $ax^2 + bx + c = 0$).

$x^2 + 6 = 4x$

$x^2 - 4x + 6 = 0$

$x = \dfrac{4 \pm \sqrt{16 - 24}}{2} = \dfrac{4 \pm \sqrt{-8}}{2} = \dfrac{4 \pm 2\sqrt{2}\, i}{2} = 2 \pm \sqrt{2}\, i$

3. $\dfrac{1 - \sqrt{-2}}{2 + \sqrt{-1}} = \dfrac{1 - \sqrt{2}i}{2 + i} \cdot \dfrac{2 - i}{2 - i} = \dfrac{2 - \sqrt{2} - 2\sqrt{2}i - i}{4 - i^2} = \dfrac{2 - \sqrt{2}}{5} + \dfrac{(-2\sqrt{2} - 1)\, i}{5}$

4. $x^{3/2} - 4x^{-1/2} = 0$ Multiply by $x^{1/2}$ on both sides of eq'n. ...(or by $\dfrac{x^{½}}{x^{½}}$ on one side.)

$x^2 - 4 = 0$ In so doing, we note that x CANNOT be 0....

$(x + 2)(x - 2) = 0$

$x = -2$ or $x = 2$ Solutions: $x = -2, 2$

5. To solve a rational nonlinear inequality SOP: compare to 0 and simplify !

$\dfrac{4}{x} \le x$ Stick to the plan !

$\dfrac{4}{x} - x \le 0$

$\dfrac{4 - x^2}{x} \le 0$

$\dfrac{(2 - x)(2 + x)}{x} \le 0$

+	0	–	#	+	0	–
	-2		0		2	

The solution set is $[-2, 0) \cup [2, \infty)$

6. $3 - 2|x + 2| \le 1$ Add the 2|x+2| to both sides.,

$2 \le 2|x + 2|$ Subtract 1 from both sides, divide by 2

$1 \le |x + 2|$ ... And solve via " $x + 2 \le -1$ or $1 \le x + 2$" e t c e t e r a . . . .

$1 \le |x - -2|$ Or write this way, see the distance between x and -2 must exceed 1,

$x \le -3$ Or $-1 \le x$ so x must be 1 unit or more away from -2...

x is in $(-\infty, -3] \cup [-1, \infty)$ (Note interval notation is required.)