

MTH 112 CLASS NOTES - MONDAY 8-27-12

Ch. 6-3 Solution By QUADRATIC FORMULA

(Ex 3) $4 - \frac{3}{x} + \frac{4}{x^2} = 0 \quad x \neq 0$
Pg 273

Table - Pg 274

Interpreting discriminant $= b^2 - 4ac$

$$d = \emptyset \quad | \quad d > 0 \quad | \quad d < 0$$

Ch 6-5 Radical Equations

"equations with a radical"

or $\Downarrow$ fractional exponent

$$a^{\frac{m}{n}} = \sqrt[n]{a^m} \text{ or } (\sqrt[n]{a})^m$$

May create false or EXTRANEOUS SOLUTIONS

- ISOLATE RADICAL
- "UNDO" radical
- solve
- CK ALL POSSIBLE SOLUTIONS

Ex 3
273

$$4 - \frac{3}{x} + \frac{4}{x^2} = 0 \quad x \neq 0$$

$$4x^2 - 3x + 4 = 0$$

$$a = 4$$

$$b^2 - 4ac$$

$$b = -3$$

$$(-3)^2 - 4(4)(4)$$

$$c = 4$$

$$9 - 64 = \boxed{-55 = d}$$

$$x = \frac{-b \pm \sqrt{d}}{2a} = \frac{3 \pm \sqrt{-55}}{8}$$

$$x = \frac{3 \pm i\sqrt{55}}{8}$$

Check

$$\frac{-3}{\left(\frac{3+i\sqrt{55}}{8}\right)} + \frac{4}{\left(\frac{3+i\sqrt{55}}{8}\right)^2} \stackrel{?}{=} -4$$

$$\frac{-24}{3+i\sqrt{55}} + \frac{4}{\frac{9+6i\sqrt{55}-55}{64}}$$

CK (cont)

$$\frac{-24}{3+i\sqrt{55}} + \frac{256}{6i\sqrt{55}-46} \stackrel{?}{=} -4$$

$$\frac{-24}{3+i\sqrt{55}} + \frac{128}{-23+3i\sqrt{55}}$$

PART 1

$$\frac{-24}{3+i\sqrt{55}} \cdot \frac{3-i\sqrt{55}}{3-i\sqrt{55}} = \frac{-72+24i\sqrt{55}}{9+55} = \frac{-72+24i\sqrt{55}}{64}$$

PART 2

$$\frac{128}{-23+3i\sqrt{55}} \cdot \frac{-23-3i\sqrt{55}}{-23-3i\sqrt{55}} = \frac{[-128(23)] - 384i\sqrt{55}}{(23^2) + (9 \cdot 55)}$$

$$\frac{-72+24i\sqrt{55}}{64} + \frac{[-128(23)] - 384i\sqrt{55}}{(23)^2 + (9 \cdot 55)} \stackrel{?}{=} -4$$

$$\frac{-9+3i\sqrt{55}}{8} + \frac{-2944-384i\sqrt{55}}{529+495} \stackrel{?}{=} -4$$

1024

$$\frac{-9+3i\sqrt{55}}{8} + \frac{-1472-192i\sqrt{55}}{512} \stackrel{?}{=} -4$$

Keep dividing RIGHT TERM By 2

$$\frac{-9+3i\sqrt{55}}{8} + \frac{-7.36-96i\sqrt{55}}{256} \stackrel{?}{=} -4$$

$$\frac{-9+3i\sqrt{55}}{8} + \frac{-368-48i\sqrt{55}}{128} \stackrel{?}{=} -4$$

$$\frac{-9+3i\sqrt{55}}{8} + \frac{-18.4-24i\sqrt{55}}{64} \stackrel{?}{=} -4$$

$$\frac{-9+3i\sqrt{55}}{8} + \frac{-23-3i\sqrt{55}}{8} \stackrel{?}{=} -4$$

64
Divide by 8

$$\frac{-9-23}{8} \stackrel{?}{=} -4$$

$$\frac{-32}{8} \stackrel{?}{=} -4$$

$$-4 \stackrel{?}{=} -4$$



WHEW

I Am pretty CONFIDENT

$$X = \frac{3 \pm i\sqrt{55}}{8} \text{ is correct } \textcircled{\text{😊}}$$

$$\textcircled{21} \left(\sqrt{12-b} \right)^2 = \left(\sqrt{19-2b} \right)^2$$

$$\begin{array}{ccc} & \swarrow & \searrow \\ 12-b & = & 19-2b \\ -12+2b & & -12+2b \end{array}$$

$$\boxed{b = 7}$$

$$\underline{\underline{CK}} \quad \sqrt{12-(7)} \stackrel{?}{=} \sqrt{19-2(7)}$$

$$\sqrt{5} \stackrel{?}{=} \sqrt{5} \quad \checkmark$$

(27.)

$$\sqrt{6N} = N$$

$$6N = N^2$$

$$N^2 - 6N = 0$$

$$N(N-6) = 0 \quad \checkmark \quad \checkmark$$

$$\boxed{N = \{0, 6\}}$$

$$\underline{\underline{CK}} \quad \sqrt{6(0)} \stackrel{?}{=} (0) \quad \bigg| \quad \underline{\underline{CK}} \quad \sqrt{6(6)} \stackrel{?}{=} (6) \quad \checkmark$$