

Math 112 | Tues. | 9-4-12

EX1
Pg 290

$$x^4 + 4x^2 - 12 = 0$$

Let $u = x^2$

$$u^2 + 4u - 12 = 0$$

$$\text{Sum} = 4$$

$$\text{prod} = -12$$

$$\wedge$$

$$(u-2)(u+6) = 0$$

$$u = 2$$

↓

$$x^2 = 2$$

$$x = \pm \sqrt{2}$$

$$u = -6$$

↓

$$x^2 = -6$$

$$x = \pm i\sqrt{6}$$

$$\checkmark (\sqrt{2})^4 + 4(\sqrt{2})^2$$

$$4 + 8$$

$$12 \checkmark$$

$$\checkmark (i\sqrt{6})^4 + 4(i\sqrt{6})^2$$

$$36 + (-24)$$

$$12 \checkmark$$

EX 2
pg 290

$$y + 3\sqrt{y} - 4 = 0$$

$$\text{Let } u = \sqrt{y}$$

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

$$\text{sum} = 3$$

$$\text{prod} = -4$$

$$\begin{array}{c} 1 \quad 4 \\ -1 \quad +4 \end{array}$$

$$(u-1)(u+4) = 0$$

$$u = 1$$

$$\sqrt{y} = 1$$

$$y = 1$$

CK

$$(1) + 3\sqrt{(1)}$$

✓

$$u = -4$$

$$\sqrt{y} = -4$$

$$y = 16$$

CK

$$(16) + 3\sqrt{(16)}$$

$$16 + 12 \neq 4$$

FALSE

$$y = \{1\}$$

Ex
 (3)
 PS291

$$3x^{-2} + 7x^{-1} - 6 = 0$$

$$\text{Let } u = x^{-1}$$

$$3u^2 + 7u - 6 = 0$$

$$\begin{aligned} \text{sum} &= 7 \\ \text{prod} &= -18 \\ &\quad \quad \quad \begin{matrix} 2 & + & 9 \end{matrix} \end{aligned}$$

$$(3u^2 - 2u) + (9u - 6) = 0$$

$$u(\underline{3u-2}) + 3(\underline{3u-2}) = 0$$

$$(3u-2)(u+3) = 0$$

$$u = \frac{2}{3}$$

~~$$\frac{1}{x} = \frac{2}{3}$$~~

$$2x = 3$$

$$x = \frac{3}{2}$$

$$u = -3$$

$$\frac{1}{x} = -3$$

$$x = -\frac{1}{3}$$

$$\underline{\underline{CK}} \quad 3\left(\frac{3}{2}\right)^{-2} + 7\left(\frac{3}{2}\right)^{-1} \stackrel{?}{=} 6$$

$$3\left(\frac{1}{\frac{9}{4}}\right) + 7\left(\frac{1}{\frac{3}{2}}\right) \stackrel{?}{=} 6$$

$$\frac{12}{9} + \frac{14}{3} \stackrel{?}{=} 6$$

$$\frac{4}{3} + \frac{14}{3} \stackrel{?}{=} 6 \checkmark$$

$$\underline{\underline{CK}} \quad 3\left(-\frac{1}{3}\right)^{-2} + 7\left(-\frac{1}{3}\right)^{-1} \stackrel{?}{=} 6$$

$$3\left(\frac{1}{\frac{1}{9}}\right) + 7\left(\frac{1}{\frac{1}{3}}\right) \stackrel{?}{=} 6$$

$$27 - 21 \stackrel{?}{=} 6 \checkmark$$