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PRODI: TEKNIK INFORMATIKA

TUGAS 4

1. $\sqrt{x^2-4}=\sqrt{x+2}$

$x^2-4=x+2$

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

$x^2-x-6=0$

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

$x-3=0 \qquad x+2=0$

$x=3 \qquad x=-2$

Untuk, $x=3$

$\sqrt{3^2-4}=\sqrt{3+2}$

$\sqrt{9-4}=\sqrt{5}$

$\sqrt{5}=\sqrt{5}$

Untuk, $x=-2$

$\sqrt{-2^2-4}=\sqrt{-2+2}$

$\sqrt{4-4}=\sqrt{-2+2}$

$\sqrt{0}=\sqrt{0}$

Jadi persamaan tersebut yang memenuhi adalah $x=3\ dan\ x=-2$

2. $\sqrt{(x-5)}=2x-11$

$$x - 5 = (2x - 11)^2$$

$$x - 5 = (2x - 11)(2x - 11)$$

$$x - 5 = 4x^2 - 22x - 22x + 121$$

$$x - 5 = 4x^2 - 44x + 121$$

$$0 = 4x^2 - 44x - x + 121 + 5$$

$$0 = 4x^2 - 45x + 126$$

$$0 = (4x - 21)(x - 6)$$

$4x - 21 = 0$ $\qquad$ $x - 6 = 0$

$x = \frac{21}{4}$ $\qquad$ $x = 6$

untuk $x = \frac{21}{4}$,

$$\sqrt{\frac{21}{4} - 5} = 2\frac{21}{4} - 11$$

$$\sqrt{\frac{21}{4} - \frac{20}{4}} = \frac{42}{4} - \frac{44}{4}$$

$$\sqrt{\frac{1}{4}} = -\frac{2}{4}$$

$$\frac{1}{2} = -\frac{1}{2}$$

untuk $x = 6$,

$$\sqrt{6 - 5} = 2(6) - 11$$

$$\sqrt{1} = 12 - 11$$

$$1 = 1$$

jadi, persamaan tersebu yang memenuhi adalah $x = 6$

3. $1 + x\sqrt{5} = \sqrt{5 - x}$

$$1 + \sqrt{5}x = \sqrt{5 - x}$$

$$\left(1+\sqrt{5}x\right)^2 = 5-x$$

$$\left(1+\sqrt{5}x\right)\left(1+\sqrt{5}x\right) = 5-x$$

$$1+\sqrt{5}x+\sqrt{5}x+5x^2 = 5-x$$

$$1+2\sqrt{5}x+5x^2 = 5-x$$

$$5x^2+2\sqrt{5}x+x+1-5 = 0$$

$$5x^2+\left(2\sqrt{5}+1\right)x-4 = 0$$

rumus persamaan kuadrat, $x = \frac{-b\pm\sqrt{b^2-4ac}}{2a}, a = 5,\ b = 2\sqrt{5}+1,\ c = -4$

$$x = \frac{-\left(2\sqrt{5}+1\right)\pm\sqrt{\left(2\sqrt{5}+1\right)^2-4(5)(-4)}}{2(5)}$$

$$= \frac{-2\sqrt{5}-1\pm\sqrt{21+4\sqrt{5}+80}}{10}$$

$$= \frac{-2\sqrt{5}-1\pm\sqrt{101+4\sqrt{5}}}{10}$$

$$= \frac{-2\left(5^{\frac{1}{2}}\right)-1\pm\sqrt{101+4\left(5^{\frac{1}{2}}\right)}}{10}$$

$$= \frac{-2(2,2)-1\pm\sqrt{101+4(2,2)}}{10}$$

$$= \frac{-5,4\pm\sqrt{101+8,8}}{10}$$

$$= \frac{-5,4\pm\sqrt{109,8}}{10} \qquad pembulatan\ -5,4\approx -5\ dan\ 109,8\approx 110$$

$$x_1 = \frac{-5+\sqrt{110}}{10} \qquad x_2 = \frac{-5-\sqrt{110}}{10}$$

$$= \frac{-5+10,4}{10} \qquad = \frac{-5-10,4}{10}$$

$$= \frac{5}{10} = \frac{1}{2} \qquad = \frac{-15,8}{10}$$

$$= 0,5 \qquad = -1,58\approx -1,6$$

Untuk $x = -1,6$

$$1+\sqrt{5}(-1,6) = \sqrt{5-(-1,6)}$$

$$\mathbf{1 + 5^{\frac{1}{2}}(-1,6) = \sqrt{6,6}}$$

$$\mathbf{1 + 2,2(-1,6) = 2,5}$$

$$\mathbf{-2,5 = 2,5}$$

Untuk $x = 0,5$

$$\mathbf{1 + \sqrt{5}(0,5) = \sqrt{5 - 0,5}}$$

$$\mathbf{1 + 5^{\frac{1}{2}}(0,5) = \sqrt{4,5}}$$

$$\mathbf{1 + 2,2(0,5) = 2,1}$$

$$\mathbf{2,1 = 2,1}$$

Jadi, persamaan tersebut yang memenuhi adalah $x = 0,5$