MATH LEAGUE 7TH WEEK SOLUTIONS:

1- <u>SOVING THE EQUATION:</u>

$$x = \sqrt{5 + \frac{\sqrt{99}}{2}}\sqrt{5 - \frac{\sqrt{99}}{2}}$$

$$x = \sqrt{\left(5 + \frac{\sqrt{99}}{2}\right) \times \left(5 - \frac{\sqrt{99}}{2}\right)}$$

$$x = \sqrt{\left(5 + \frac{3\sqrt{11}}{2}\right) \times \left(5 - \frac{3\sqrt{11}}{2}\right)}$$

$$x = \sqrt{25 - \frac{9 \times 11}{4}}$$

$$x = \sqrt{25 - \frac{99}{4}}$$

$$x = \sqrt{\frac{1}{4}}$$

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

2- <u>FINDING THE VALUE OF THE EXPRESSION:</u>

$$xy = 25$$

$$\sqrt{xy} = 5$$

$$x + y + 2\sqrt{xy} = 39 + 2 \times 5$$

$$x + y + 2\sqrt{xy} = \left(\sqrt{x} + \sqrt{y}\right)^2$$

$$\left(\sqrt{x} + \sqrt{y}\right)^2 = 49$$

$$\sqrt{x} + \sqrt{y} = \sqrt{49}$$

$$\sqrt{x} + \sqrt{y} = 7$$

3- <u>SOLVING THE EQUATION:</u>

$$\sqrt{x + \sqrt{x + 11}} + \sqrt{x - \sqrt{x + 11}} = 4$$

Square both sides then

$$\left(\sqrt{x + \sqrt{x + 11}} + \sqrt{x - \sqrt{x + 11}}\right)^2 = 4^2$$

$$\Rightarrow \left(x + \sqrt{x + 11}\right) + \left(x - \sqrt{x + 11}\right) - 2 \cdot \sqrt{x + \sqrt{x + 11}} \cdot \sqrt{x - \sqrt{x + 11}} = 16$$

$$\Rightarrow x + \sqrt{x + 11} + x - \sqrt{x + 11} - 2 \cdot \sqrt{\left(x + \sqrt{x + 11}\right)\left(x - \sqrt{x + 11}\right)} = 16$$

$$\Rightarrow 2x - 2 \cdot \sqrt{x^2 - x - 11} = 16$$

$$\Rightarrow \sqrt{x^2 - x - 11} = x - 8$$

$$\Rightarrow x^2 - x - 11 = (x - 8)^2$$

$$\Rightarrow x^2 - x - 11 = x^2 - 16x + 64$$

$$\Rightarrow 15x = 75$$

$$\Rightarrow \boxed{x = 5}$$