Ma50002c:2262

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13:20

a) $(x+1) - 27\sqrt{x+1} + 170 = 0$

Sätt $\sqrt{x+1} = t$. Då $x+1 = t^2$ och

$$t^2 - 27t + 170 = 0$$

$$\Leftrightarrow$$

$$t = \frac{27}{2} \pm \sqrt{\left(\frac{27}{2}\right)^2 - 170} = \frac{27}{2} \pm \sqrt{\frac{49}{4}} = \frac{27}{2} \pm \frac{7}{2}$$

$$\Leftrightarrow$$

$$t_1 = 17 \quad , t_2 = 10$$

Återsubstituera.

$t_1 = 17$ ger $\sqrt{x+1} = 17 \Leftrightarrow x = 17^2 - 1 = \underline{288}$

$t_1 = 10$ ger $\sqrt{x+1} = 10 \Leftrightarrow x = 10^2 - 1 = \underline{99}$

b) $\sqrt{t+9} - \sqrt{t} = 1$ (Kommer att kräva två kvadreringar)

$$\Rightarrow$$

$$\left(\sqrt{t+9} - \sqrt{t}\right)^2 = 1^2$$

$$\Leftrightarrow$$

$$t+9 - 2\sqrt{t+9}\cdot\sqrt{t} + t = 1$$

$$\Leftrightarrow$$

$$2t + 8 = 2\sqrt{t+9}\cdot\sqrt{t}$$

$$\Leftrightarrow$$

$$t+4=\sqrt{t+9}\cdot\sqrt{t}$$
$$\Rightarrow$$
$$(t+4)^2=\left(\sqrt{t+9}\cdot\sqrt{t}\right)^2$$
$$\Leftrightarrow$$
$$t^2+8t+16=(t+9)\cdot t$$
$$\Leftrightarrow$$
$$t^2+8t+16=t^2+9t$$
$$\Leftrightarrow$$
$$\underline{t=16}$$

Undersök i ursprungseku om $t=16$ duger

$VL=\sqrt{16+9}-\sqrt{16}=5-4=1$ JA.

$HL=1$

c) $$\sqrt{s+13}-\sqrt{7-s}=2$$
$$\Rightarrow$$
$$\left(\sqrt{s+13}-\sqrt{7-s}\right)^2=2^2$$
$$\Leftrightarrow$$
$$s+13-2\sqrt{s+13}\sqrt{7-s}+7-s=4$$
$$\Leftrightarrow$$
$$16=2\sqrt{s+13}\sqrt{7-s}$$
$$\Leftrightarrow$$
$$8=\sqrt{s+13}\sqrt{7-s}$$
$$\Rightarrow$$

$$8^2 = (s+13)(7-s)$$

$$\Leftrightarrow$$

$$64 = 7s - s^2 + 91 - 13s$$

$$\Leftrightarrow$$

$$s^2 + 6s - 27 = 0$$

$$\Leftrightarrow$$

$$s = -3 \pm \sqrt{3^2+27} = -3 \pm 6$$

$$\Leftrightarrow$$

$$s_1 = 3 \, , \quad s_2 = -9$$

Undersök i ursprungsekv om duger

$s_1 = 3$: $\quad VL = \sqrt{3+13} - \sqrt{7-3} = 4-2 = 2 = HL$

ok

$s_2 = -9$ $\quad VL = \sqrt{-9+13} - \sqrt{7-(-9)} = 2 - 4 = -2$

ej ok

Svar: $s = 3$.