HOMEWORK - SOLUTIONS

SECTION 1.6 - SUMMARY PAGE 145

(12) $\sqrt{x+2}+1=\sqrt{2x+6}$ $/^2$

$(\sqrt{x+2}+1)^2=(\sqrt{2x+6})^2$

$x+2+2\sqrt{x+2}+1=2x+6$

$x+3+2\sqrt{x+2}=2x+6$

$2\sqrt{x+2}=x+3$ $/^2$

$(2\sqrt{x+2})^2=(x+3)^2$

$4(x+2)=x^2+6x+9$

$4x+8=x^2+6x+9$

$x^2+2x+1=0$

$(x+1)^2=0$

$x=-1$

check:

$\sqrt{-1+2}+1 \stackrel{?}{=} \sqrt{2(-1)+6}$

$1+1=\sqrt{4}$ true

Therefore, $\boxed{x \in \{-1\}}$

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(18) $\sqrt{x}+1=\sqrt{11-\sqrt{x}}$ $/^2$

$(\sqrt{x}+1)^2=(\sqrt{11-\sqrt{x}})^2$

$x+2\sqrt{x}+1=11-\sqrt{x}$

$2\sqrt{x}+\sqrt{x}=11-1-x$

$3\sqrt{x}=10-x$ $/^2$

$(3\sqrt{x})^2=(10-x)^2$

$9x=100-20x+x^2$

$x^2-29x+100=0$

$(x-4)(x-25)=0$

$x=4$ OR $x=25$

check $x=4$:

$\sqrt{4}+1 \stackrel{?}{=} \sqrt{11-\sqrt{4}}$

$2+1=\sqrt{11-2}$ true

check $x=25$:

$\sqrt{25}+1=\sqrt{11-\sqrt{25}}$ false

Therefore, $\boxed{x \in \{4\}}$

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(20) $2x^{-1}-x^{-2}=1$

Method I $\frac{2}{x}-\frac{1}{x^2}=1$ $/\cdot x^2$

$x \neq 0$

$2x-1=x^2$

$x^2-2x+1=0$

$(x-1)^2=0$

$\boxed{x=1}$

Method II let $x^{-1}=t$

then $x^{-2}=t^2$

then: $2t-t^2=1$

$t^2-2t+1=0$

$(t-1)^2=0$

$t=1$

so $x^{-1}=1$

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

so $\boxed{x=1}$