Algebra 2

Ch. 7 Handout 7.5

Solving Square Roots and Other Radical Equations

5. Solve $(x+1)^{\frac{2}{3}} - (9x+1)^{\frac{1}{3}} = 0$. Check for extraneous solutions.

$\sqrt[3]{(x+1)^2} - \sqrt[3]{9x+1} = 0$

$+\sqrt[3]{9x+1} \quad \sqrt[3]{9x+1}$

$\left(\sqrt[3]{(x+1)^2}\right)^3 = \left(\sqrt[3]{9x+1}\right)^3$

$(x+1)^2 = 9x+1$

$(x+1)(x+1) = 9x+1$

$x^2 + 2x + 1 = 9x + 1$

$-9x - 1 \quad -9x - 1$

$x^2 - 7x = 0$

$x(x-7) = 0$

$\boxed{x = 0}$ $x - 7 = 0$

$\boxed{x = 7}$

$x=0$ $\sqrt[3]{(x+1)^2} = \sqrt[3]{9x+1}$

$\sqrt[3]{(0+1)^2} = \sqrt[3]{9(0)+1}$

$1 = 1$ ✓

$x=7$ $\sqrt[3]{(7+1)^2} = \sqrt[3]{9 \cdot 7 + 1}$

$\sqrt[3]{64} = \sqrt[3]{64}$ ✓

6. Solve $\sqrt{3x+2}-\sqrt{2x+7}=0$. Check for extraneous solutions

$\sqrt{3x+2}-\sqrt{2x+7}=0$

$+\sqrt{2x+7}\quad+\sqrt{2x+7}$

$(\sqrt{3x+2})^2=(\sqrt{2x+7})^2$

$3x+2=2x+7$

$-2x\qquad-2x$

$x+2=7$

$-2\quad-2$

$\boxed{x=5}$

$\sqrt{3x+2}=\sqrt{2x+7}$

$\sqrt{3\cdot5+2}=\sqrt{2\cdot5+7}$

$\sqrt{17}=\sqrt{17}$ ✓

7. Solve $\sqrt{x+10}+\sqrt{3-x}=5$. Check for extraneous solutions.

$\sqrt{x+10}+\sqrt{3-x}=5$

$-\sqrt{3-x}\quad -\sqrt{3-x}$

$(\sqrt{x+10})^2=(5-\sqrt{3-x})^2$

$x+10=(5-\sqrt{3-x})(5-\sqrt{3-x})$

$x+10=25-5\sqrt{3-x}-5\sqrt{3-x}+3-x$

$x+10=28-x-10\sqrt{3-x}$

$+x\ -28\quad -28+x$

$\frac{2x}{2}-\frac{18}{2}=\frac{-10\sqrt{3-x}}{2}$

$(x-9)^2=(-5\sqrt{3-x})^2$

$(x-9)(x-9)=(-5\sqrt{3-x})(-5\sqrt{3-x})$

$x^2-18x+81=25(3-x)$

$x^2-18x+81=75-25x$

$+25x\ -75\quad -75+25x$

$x^2+7x+6=0$

$(x+6)(x+1)=0$

$x+6=0\quad x+1=0$

$\boxed{x=-6}\quad\boxed{x=-1}$

$x=-6$ $\sqrt{x+10}+\sqrt{3-x}=5$

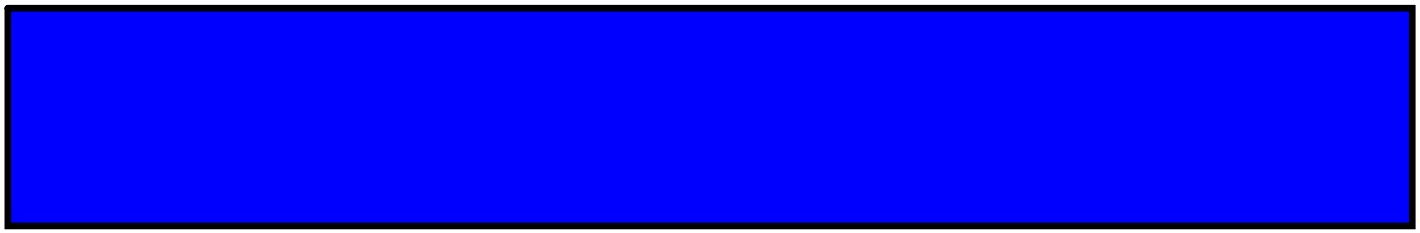
$\sqrt{-6+10}+\sqrt{3-(-6)}=5$

$\sqrt{4}+\sqrt{9}=5$ ✓

$x=-1$ $\sqrt{-1+10}+\sqrt{3-(-1)}=5$

$\sqrt{9}+\sqrt{4}=5$ ✓

Assignment:



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