2.5 Solving Radical equations Algebraically

ex.1 $\frac{3}{2} = \frac{2\sqrt{x}}{2}$

$\left(\frac{3}{2}\right)^2 = \left(\sqrt{x}\right)^2$

$\boxed{\frac{9}{4} = x}$

① isolate $\sqrt{\ }$

② square both sides

③ solve for x

④ check the answer

(*) REALLY IMPORTANT (*)

CHECK

Left side

3

Right side

$2\sqrt{x}$

$= 2\sqrt{\frac{9}{4}}$

$= \cancel{2}\left(\frac{3}{\cancel{2}}\right) = 3$

LS = RS ✓

$\boxed{x = \frac{9}{4}}$ ✓

ex.2 $\left(\sqrt{3-x}\right)^2 = (4)^2$

① isolate $\sqrt{\ }$

② square

③ solve for x

④ CHECK (*)(*)(*)

$3 - x = 16$

$-3 \qquad -3$

$\frac{-x}{-1} = \frac{13}{-1}$

$\boxed{x = -13}$ ✓

check

L.S. $\sqrt{3 - -13} = \sqrt{16} = 4 = RS$

ex. 3 $\left(\sqrt{6x+2}\right)^2 = (5)^2$

$$6x+2 = 25$$

$$6x = 23$$

$$\boxed{x = \frac{23}{6}}$$

Check → LS $\sqrt{\cancel{6}\left(\frac{23}{\cancel{6}}\right)+2} = \sqrt{25} = 5 = RS$ ✓

ex. 4 $\sqrt{2x-1} + 5 = 2$

$\quad\quad\quad\quad\quad\quad -5 \quad\quad -5$

(*) importance of checking !!!

$$\boxed{\left(\sqrt{2x-1}\right)^2 = (-3)^2}$$

$$2x-1 = 9$$

$$2x = 10$$

$$\boxed{x = 5}$$

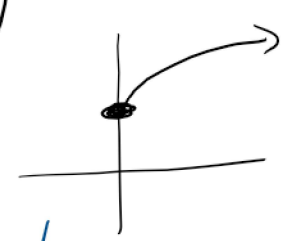
LS → $\sqrt{2(5)-1} + 5$

$\sqrt{9} + 5$

$3 + 5 = 8 \neq 2$ RS

graphing calc.

$y_1 = \sqrt{2x-1} + 3$



$x = 5$ is an extraneous root

There is <u>NO</u> <u>SOLUTION</u> (no x-intercept)

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