2.3 Solving Radical Equations

Solve $\sqrt{x+5} = 3$ in three ways.

① $y_1 = \sqrt{x+5}$ Find the intersection.

$y_2 = 3$

$(4, 3)$

↓

$x = 4$

② $y_1 = \sqrt{x+5} - 3$ Find the zero(s)/x-int(s).

$(4, 0)$

↓

$x = 4$

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

$x + 5 = 9$

$-5 \quad -5$

$x = 4$

Verify that your solution works...

$\sqrt{4+5} = 3$

$\sqrt{9} = 3$

$3 = 3$

✓

ex) Solve $\sqrt{x+5} = x+3$, 2 ways.

① $y_1 = \pm\sqrt{x+5}$

$y_2 = x+3$

$(-1, 2)$

② $(-\sqrt{x+5})^2 = (x+3)^2$

$x+5 = (x+3)(x+3)$

$x+5 = x^2+6x+9$

$0 = x^2+5x+4$

$0 = (x+4)(x+1)$

~~$x=-4$~~ $x=-1$

Verify...

$\sqrt{-1+5} = -1+3$

$\sqrt{4} = 2$

$2 = 2$ ✓

$\sqrt{-4+5} = -4+3$

$\sqrt{1} = -1$

$1 \neq -1$

pg. 96-97 #2-7, 9