Radical Expressions

Ex: $\sqrt{48} = \sqrt{4}\sqrt{12} = 2\sqrt{12} = 4\sqrt{3}$

Ex: $\sqrt{3-2\sqrt{2}} = \sqrt{a}-\sqrt{b}$ $\overset{?}{=}$ $\sqrt{2}-1$ $\overset{?}{\approx} 0.414$

$= 1-\sqrt{2}$ $\overset{?}{\approx} -0.414$

$3-2\sqrt{2} = a - 2\sqrt{ab} + b$

$3 = a+b$ $\quad 2\sqrt{2} = 2\sqrt{ab}$ $\quad a=1, b=2$

$2 = ab$ $\quad a=2, b=1$

Ex: $\sqrt{x^2+9} = 2x-3$ $\quad \sqrt{16+9} = 2\cdot 4 - 3$

$9 \quad\quad 9$ $\quad 5 \quad\quad 5$ ✓

$x^2+9 = (2x-3)^2$

$\sqrt{0^2+9} = 2\cdot 0 - 3$

$x^2+9 = 4x^2-12x+9$ $\quad 3 = -3$ ✗

$9 = 9$ ✓

$0 = 3x^2 - 12x = 3x(x-4)$ $\quad x = \cancel{0}, 4$