Rationalize denominators, numerators

1) $\dfrac{2}{(3\sqrt{2}+4)}\cdot\dfrac{(3\sqrt{2}-4)}{(3\sqrt{2}-4)}$ $(a-b)(a+b)$ a^2-b^2

$$\frac{6\sqrt{2}-8}{(3\sqrt{2})^2-(4)^2} = \frac{6\sqrt{2}-8}{2}$$

$$9\cdot 2 - 16 \qquad = 3\sqrt{2}-4$$

Radical eqns

$\sqrt{2x-3} = 9$

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

$2x - 3 = 81$

$x = 42$

$\sqrt{2(42)-3} = 9$

$\sqrt{81} = 9$ ✓

If $a = b$ then $a^2 = b^2$

$(-2)^2 = 2^2$

$4 = 4$

$-2 \neq 2$

$\sqrt{-10x-1} + 3x = 0$

1) Isolate Radical

$\sqrt{-10x-1} = -3x$

$a+b = -$

a^2+b^2 X

② Square Both sides

$-10x-1 = 9x^2$

$0 = 9x^2+10x+1$

$9x^2 + 10x + 1 = 0$

$(9x + 1)(x + 1) = 0$

$9 \cdot 1 = 9$

9	10
1, 9	

Factor by grouping

$9x^2 + 9x + (x + 1) = 0$

GCF

$9x(x + 1) + (x + 1) = 0$

$(x + 1)(9x + 1) = 0$

$$(x+1)(9x+1)=0$$

$$\sqrt{\frac{19}{9}}-\frac{1}{3}=0 \qquad x=-1,\ -\frac{1}{9}$$

$$\sqrt{-10x+1}+3x=0$$

(-1) $\qquad$ $(-\frac{1}{9})$

$$\sqrt{11}-13x\neq 0$$

$$\left(\sqrt{-\frac{10}{1}\left(-\frac{1}{9}\right)+1}+3\left(-\frac{1}{9}\right)\neq 0\right)$$

$$\sqrt{-10x-1} + 3x = 0$$

$$x = -\frac{1}{9}, \quad x = -1$$

$$\sqrt{-10\left(-\frac{1}{9}\right)-1} + 3\left(-\frac{1}{9}\right) = 0$$

$$\sqrt{\frac{10}{9} - \frac{9}{9}}$$

$$\sqrt{\frac{1}{9}} + -\frac{3}{9} = 0$$

$$\frac{1}{3} - \frac{1}{3} = 0$$

$$\sqrt{-10x-1}+3x=0$$

$$\sqrt{10-1}+3(-1)=0 \quad x=-1$$

$$\sqrt{9}+(-3)=0$$

$$3+-3=0$$

$$(\sqrt{4-x})^2 = (x-2)^2$$

square the first term, square thel last term, double the product

$$4 - x = x^2 + 2(-2x) + 4$$

$$4 - x = x^2 - 4x + 4$$

$$0 = x^2 - 3x$$

$$0 = x(x-3)$$

$$x = 3, \; x = 0$$

$\sqrt{4-x} = x-2$

$x=3 \quad \sqrt{1} = 1 \quad$ True

$x=6 \quad \sqrt{4} = 0-2$

$2 \neq -2$ False

0 is an extraneous solution