

RADICAL EQUATIONS

1. GET A RADICAL BY ITSELF UNLESS IT CREATES A FRACTION
2. RAISE BOTH SIDES TO A POWER EQUAL TO INDEX
3. IF MORE RADICALS, GO BACK TO STEP 1
4. SOLVE FOR X
5. CHECK ANSWER(S)

① $\sqrt{x-2} = 4$
 $(\sqrt{x-2})^2 = (4)^2$
 $x-2 = 16$
 $x = 16+2$
 $x = 18$

② $\sqrt[3]{9x-1} = 2$
 $(\sqrt[3]{9x-1})^3 = 2^3$
 $9x-1 = 8$
 $9x = 8+1$
 $9x = 9$
 $\frac{9x}{9} = \frac{9}{9}$
 $x = 1$

③ $3\sqrt{x} = 2x$
 $(3\sqrt{x})^2 = (2x)^2$
 $3^2 (\sqrt{x})^2 = 4x^2$
 $9x = 4x^2$
 $0 = 4x^2 - 9x$
 $0 = x(4x-9)$
 $x=0 \quad 4x-9=0$
 $4x=9$
 $\frac{4x}{4} = \frac{9}{4}$
 $x=0 \quad x = \frac{9}{4}$

④ $\sqrt{-6+11x-2} = x$
 $\sqrt{-6+11x} = x+2$
 $(\sqrt{-6+11x})^2 = (x+2)^2$
 $-6+11x = (x+2)(x+2)$
 $-6+11x = x^2+2x+2x+4$
 $-6+11x = x^2+4x+4$
 $0 = x^2+4x-11x+4+6$
 $0 = x^2-7x+10$ (PSD)
 $0 = (x-2)(x-5)$
 $x-2=0 \quad x-5=0$
 $x=2 \quad x=5$

⑤ $\sqrt[3]{8x-1} = \sqrt[3]{3x+5}$
 $(\sqrt[3]{8x-1})^3 = (\sqrt[3]{3x+5})^3$
 $8x-1 = 3x+5$
 $8x-3x = 5+1$
 $5x = 6$
 $x = \frac{6}{5}$

⑥ $\sqrt{2x+7} = 2+\sqrt{x}$
 $(\sqrt{2x+7})^2 = (2+\sqrt{x})^2$
 $2x+7 = (2+\sqrt{x})(2+\sqrt{x})$
 $2x+7 = 4+2\sqrt{x}+2\sqrt{x}+x$
 $2x+7 = x+4+4\sqrt{x}$
 $2x-x+7-4 = 4\sqrt{x}$
 $x+3 = 4\sqrt{x}$
 $(x+3)^2 = (4\sqrt{x})^2$
 $(x+3)(x+3) = 16x$
 $x^2+3x+3x+9 = 16x$
 $x^2+6x+9 = 16x$
 $x^2+6x-16x+9 = 0$
 $x^2-10x+9 = 0$ (PSD)
 $(x-1)(x-9) = 0$
 $x-1=0 \quad x-9=0$
 $x=1 \quad x=9$