Radical Equations

Process:

1. **Isolate the radical.**
2. **Get rid of the radical by raising both sides to the appropriate power.**

   $\left(\sqrt{x}\right)^2 = x$ $\left(\sqrt[3]{x}\right)^3 = x$ $\left(\sqrt[4]{x}\right)^4 = x$

3. **Solve the resulting equation.**
4. **Check for extraneous solutions.**

1. $\sqrt{4x+1} - 5 = 0$

2. $\sqrt[3]{x^2+4} - 1 = 4$

3. $\sqrt{x^2+16} + 6 = 1$

4. $\sqrt[4]{x^2+x-4} = 2$

5. $2x = \sqrt{4x+15}$

6. $\sqrt{3x+4} - 2 = x$

Extra Example: $\sqrt{30-2x}+x=3$

Remember that a fractional exponent can be written in radical form.

$x^{3/2}=\sqrt{x^3}$ or $\left(\sqrt{x}\right)^3$ $x^{2/5}=\sqrt[5]{x^2}$ or $\left(\sqrt[5]{x}\right)^2$

If you encounter an equation that has a variable raised to a fractional exponent, you solve it just like a radical equation.

Get rid of the radical by raising both sides to the appropriate power.

$\left(x^{3/2}\right)^{2/3}=x$ $\left(x^{2/5}\right)^{5/2}=x$

7. $\left(x^2+6x-7\right)^{3/2}=27$

8. $\left(x-2\right)^{2/3}=9$