

Solving Radical Equations

Radical equation

**If the variable is under the radical you must remove the radical by multiplying by the power of the index.

Remember that you need to rationalize the denominator if there is a radical or rational exponent

Sample:

$$x + 5 = x\sqrt{6}$$

Examples:

1. $a\sqrt{3} + 2 = 2a\sqrt{3} + 7$

Is the variable under the radical?

Get the variables on one side/constants on the other

Rationalize the denominator

2. $\sqrt{3d+1} = 4$

Is the variable under the radical? Isolate it!

Power of index

Solve for variable

3. $\sqrt{x} - 8 = 0$

Is the variable under the radical? Isolate it!

Power of index

Solve for variable

4. $1 + x\sqrt{2} = 0$

Is the variable under the radical???

Get the variables on one side/constants on the other

Rationalize the denominator

5. $\frac{2}{3}(4m)^{\frac{1}{3}} = 4$

Change to radical expression

Isolate the radical

Power of index

Solve for variable

6. $\sqrt[3]{y+1} = 2$

7. $\sqrt{x} + 4 = 0$

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

Square both side of equation

Isolate square root

Square each side

Solve for variable

9. $5\sqrt{n-2} = \sqrt{19n-29} + 3$ Square both sides of the equation

Isolate the radical

Square both sides again

Solve for the variable

Extraneous root –

10. $\sqrt{a+1} = \sqrt{a+6} - 1$ Square both sides

Isolate the radical

Square both sides

Solve for variable

Application problem – An airplane flew due north 200 miles, then SE 282 miles. How far east of the airport is the plane?

