**Radicals guide sheet.**

1. **Simplifying radicals**
2. If you have an even number divide by 2 , and if it is an odd number divide by 3 .

For odd numbers, if the result of a division was a decimal number, try 5, 7 ,….etc.

1. For any term X, Y , Z… , break it down as a multiple of a power 1 .

Example X3 = X.X.X a4 = a.a.a.a

1. Follow the radical order for repeating units that go from inside to outside radical sign.

For example, $\sqrt{8 }$ = $\sqrt{2.2.2 }$ = 2$\sqrt{2}$ because it is second order radical , every two 2 go outside as one 2 .

1. **Addition and subtraction of radicals**.
2. Simplify the radical first, then add or subtract.
3. **You can only** add or subtract same order of radical and same radicand
4. **Multiplication of radicals**
5. Multiply the numbers outside Radicals first , then multiply the numbers under the radical $\sqrt{}$symbol **for only same order of radicals**.

Example, ( 2 $\sqrt{5} ) ( 3 \sqrt[. ]{5}$) = 6 $\sqrt{25 }$ = 6 x 5 = 30

1. Multiply first, then simplify.
2. **Davison of radicals**
3. Write the fraction under the radical symbol as two radicals, one in the top and the other in the bottom.

Example $\sqrt[n]{\frac{a}{b}}$ **=** $\frac{\sqrt[n]{a}}{\sqrt[n]{b}}$

1. Rationalize the dominator, that means that **you cannot have a radical in the dominator**, so multiply top and bottom by the bottom.

Example, $\frac{3}{\sqrt{2}}= \frac{3}{\sqrt{2}} \left( \frac{\sqrt{2}}{\sqrt{2}} \right)$

1. Use conjugate if you have it in the dominator

Example , $\frac{5}{( 3-\sqrt{2) }}$ **= ,** $\frac{5}{( 3-\sqrt{2) }}$ **.** $\frac{( 3+\sqrt{2 ) }}{( 3+\sqrt{2 )} }$