

Rational (aka "Fraction") Exponents

MCF3M

2^{-3}	
2^{-2}	
2^{-1}	
2^0	1
2^1	2
2^2	4
2^3	8
2^4	16

9^{-}	
9^{-1}	
9^0	1
9^1	9
9^2	81

4^{-2}	
4^{-1}	
4^0	1
4^1	4
4^2	16

In general $a^{\frac{1}{2}} =$

But what about $9^{\frac{1}{3}}$? And $2^{\frac{1}{4}}$ and so on?

Exponent laws can help as well.

$$4^{\frac{1}{2}} \times 4^{\frac{1}{2}} =$$

$$5^{\frac{1}{2}} \times 5^{\frac{1}{2}} =$$

$$8^{\frac{1}{3}} \times 8^{\frac{1}{3}} \times 8^{\frac{1}{3}} =$$

$$32^{\frac{1}{5}} \times 32^{\frac{1}{5}} \times 32^{\frac{1}{5}} \times 32^{\frac{1}{5}} \times 32^{\frac{1}{5}} =$$

In general: $a^{\frac{1}{n}} =$

Examples: Evaluate the following:

$$81^{\frac{1}{2}}$$

$$16^{\frac{1}{4}}$$

$$25^{\frac{1}{3}}$$

$$16^{-\frac{1}{2}}$$

How might we evaluate the following?

$$81^{\frac{3}{4}}$$

$$8^{\frac{2}{3}}$$

In general: $a^{\frac{m}{n}} =$

More examples.

Evaluate each of the following:

$$15^{\frac{2}{3}}$$

$$\left(\frac{9}{16}\right)^{\frac{3}{2}}$$

$$25^{\frac{3}{2}}$$

$$(-27)^{\frac{2}{3}}$$

