Exponents

We put exponents superscripted on the upper left of a number or expression.

An exponent of zero turns the number or expression to one. Natural numbers used as exponents specify how many times to multiple the number or expression times itself. A negative one turns the number or expression to it’s multiplicative inverse. A fraction indicates root finding in it’s denominator and multiplication in it’s numberator.

Examples:



On that last one: Manglish: the square of the cube root of 8!

Now exponents can only work on the adjacent number unless enabled by parenthesis.



This is especially important when the leading factor is a negative one as in

 . This is −1(3)(3) so it ends up negative. This is quite different from

(−3) (−3) = (−3) 2

When adding, you may only add “like terms” that have the same base and same exponents. Ditto for subtraction.





However when multiplying and dividing the exponents combine satisfyingly as long as they are attached to the same base.

 you add them when multiplying and subtract them when

dividing 

And when you “power up” an exponent, they multiply!



Let’s try combining some of these.



That first one is “ the reciprocal of the square of 4” and the last one is “the reciprocal of the cube root of the square root of 64”.

Now there is a way to simplify square roots and we can talk about it and, finishing up, we’ll talk about the Euclidean Distance Formula mostly because a whole lot of the answers are not perfect squares.

The old fashioned radical means the same thing as an exponent of ½. Let’s look at some of these:



Not everything works out quite that nicely though. Let’s look at numbers that are powers of 2

 

The trick is to find all the perfect squares and square root them and LEAVE everything else under the radical or in parentheses with the correct exponent.

So you have to be pretty good at factoring numbers.

Here’s another one

What is the square root of 48? Well, for openers 48 = 3(16) and 16 is a perfect square. So  .

What are the square roots of 24, 50, and 52?

The Euclidean Distance formula is a square root of a sum. Let’s look at it. If you have 2 points Point One and Point Two, you subtract the x coordinates and square that difference and you add that to the square of the difference of the y coordinates and then you take the square root of that sum. Better:



Manglish is just so much shorter!

Ok, now. What is the distance from (2, 3) to (5, 6)?



There it all is in one package.

Just a reminder:

If there are fractions involved, you’ll have numerators and denominators to deal with and you may squareroot them separately or together whichever is easier.

Let’s look at a couple of examples and then do some practice.



Practice with this and the Distance Formula



Find the distance between these point pairs.

