



# Greatest Possible Error

Coordinate Algebra

---

# Definition

- The greatest possible error of a measurement is one-half (0.5) of the unit of measure to which the measure is being rounded.

# Examples of Greatest Possible Error

The measurement 50g has been rounded to the nearest ten grams.

One-Half

So the greatest possible error is

$$(0.5) \times 10\text{g} = 5\text{g}$$

The actual measurement 'm' could vary as

$$45\text{g} \leq m \leq 55\text{g}$$

This makes sense right? Because we have a beginning 50g and the error can be 5g. So if we subtract 5g from 50g we get 45g. If we add 5g to 50g we get 55g.

# Your Turn

Find the greatest possible error while rounding a measurement 700 cm to the nearest ~~hundred~~ cm

What number do we need to multiply by one-half (0.5)?

$$100 \text{ cm} \times (0.5) = 50 \text{ cm}$$

# Now What about this?

## Another Example

Find the greatest possible error for  
19.25 m

First, what digit do we need to focus on?

Ten Hundredths

So we want to go to the nearest hundredth (0.01) of a meter (m). Therefore we need to multiply  $(0.5) \times (0.01) = 0.005$  m

Our Answer

# Your Turn Again

Find the greatest possible error for 5 g.

Lets think....What digits place is the 5 in?

Hundreds?

Ones?

Hundredths?

Tens?

Tenths?

The ones! So what do we need to do with 1?

That's right....multiply it by one-half (0.5).

$$1 \times (0.5) = .5 \text{ or } 1/2$$

Our Answer!  
Yipee!

# Put on your thinking cap!

Find the greatest possible error for  $11\frac{3}{4}$  inches.

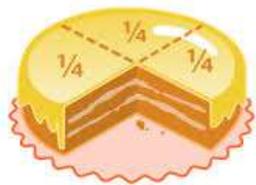
What if I changed this  $\frac{1}{4}$  to  $\frac{3}{4}$ ?

How do we solve this problem?

$$(0.5) \times (1/4 \text{ inches}) = 1/8 \text{ inches}$$

Notice we only used the  $\frac{1}{4}$ ...we don't include the 11.

So our answer is the same.  $1/8$  inches.



Remember, we're dealing with units. So  $\frac{1}{4}$  is the unit we need to use. Think about if we broke 1 into four parts. The unit would be  $\frac{1}{4}$ . ( $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{4}{4}$  or 1)

# Still need help?

A great website with a few examples:

[http://www.phschool.com/atschool/academy123/english/academy123\\_content/wl-book-demo/ph-170s.html](http://www.phschool.com/atschool/academy123/english/academy123_content/wl-book-demo/ph-170s.html)