

name:  
p\_\_\_\_\_

## Significant Figures

- 1) All non-zero digits are significant (e.g., **4.006**, **12.012**, **10.170**)
- 2) Zeros placed between non-zero digits are significant (e.g., **4.006**, **12.012**, **10.070**)
- 3) Zeros at the end of a number to the *right* of the decimal point are significant (eg., **10.070**)
- 4) Zeros to the *left* of the first non-zero digit are NOT significant (e.g., 0.0000000**2** only has 1 significant figure)
- 5) Zeros appearing at the end of a number and to the left of the decimal point are NOT significant (e.g., 750 and 12000 only have two significant figures)
- 6) To show that a number like 12000 has three significant figures, you convert the number to scientific notation, e.g.,  $1.20 \times 10^4$

When adding and multiplying significant figures, you cannot end up with a more precise measurement than when you began. For simplicity, we will use the following rule:

THE RULE: Any calculated quantity should have the same number of significant figures *as the quantity with the fewest number of significant figures* involved in the calculation.

THE RULE: Answers you calculate should have the same number of significant figures *as the quantity with the fewest number of significant figures* involved in the calculation.

Please note that these are simplified rules and not entirely correct. See Holt page 17 or Cutnell and Johnson page A1 for the full description. You will also learn them in Chemistry next year.

- 1) How many significant figures do the following quantities have?
- |                    |                               |                                |
|--------------------|-------------------------------|--------------------------------|
| a) 402 m _____     | d) 50.02 s _____              | g) 1000 J _____                |
| b) 22.40 cm _____  | e) 5240 mm _____              | h) $1.000 \times 10^2$ J _____ |
| c) 0.00070 m _____ | f) $1.50 \times 10^7$ s _____ | i) 30020 kg _____              |

WRITE CONVERSION FACTORS FOR THE FOLLOWING! (ex: 1 acre = 1/640 square miles)

2) A refrigerator box is 6 feet tall, 3 feet wide, and 3 feet deep. What is the volume of the box in cubic feet? **in cm<sup>3</sup>?**

3) A cheese pizza has a radius of 35 cm. What is the area of the pizza in square centimeters? **in acres?**

4) A car travels with an average speed of 55 miles per hour. How far (in miles) has the car traveled in 8.0 hours? **in m?**

## Unit Conversions - NOTES FROM CLASS

**Example:** Convert miles/hour to km/hour - IN CLASS

Throughout physics, we will most often use the metric system as it is universally used in science (along with the fact that it is MUCH easier to use).

<u>Symbol</u>	<u>Name</u>	<u>Numerical equivalent</u>	<u>Example</u>
n	nano	$10^{-9}$	1 nm (nanometer) = $10^{-9}$ m (meters)
$\mu$	micro	$10^{-6}$	$\mu$ s (microsecond) = $10^{-6}$ s (seconds)
m	milli	$10^{-3}$	1 ml (milliliter) = $10^{-3}$ l (liters)
c	centi	$10^{-2}$	1 cm (centimeter) = $10^{-2}$ m (meters)
k	kilo	$10^3$	1 kg (kilogram) = $10^3$ g (grams)
M	mega	$10^6$	1 MW (megawatt) = $10^6$ W (watts)
G	giga	$10^9$	1 GJ (gigajoule) = $10^9$ J (joules)
T	tera	$10^{12}$	1 TW (terawatt) = $10^{12}$ W (watts)

Give your answers to the problems below in scientific notation and using the correct number of significant figures.

3) Convert 12fl oz to ml.

2) How many cm are in a 10 km race?

3) Convert 89 km/hr to m/s.

4) Convert  $1 \text{ m}^2$  to  $\text{cm}^2$ ?