WS 0 A Brief Primer on Significant Figures for Physics NAME:________________ Per:____

When a scientist writes a number, an attempt is made to communicate how carefully it was measured. The convention is to report all measured digits, including one estimated one. these are called significant digits, or significant figures. Zeros used as place holders are tricky. A rule which helps is: Start at the left of the number and locate the first non-zero digit. Count it and all digits to the right. All are significant. One exception: in numbers like 440 or 300 or 500, the zeros are not significant; this is true only if there is no decimal point.

Examples		YOUR TURN	
Number	Number of significant digits	**Number**	**Number of significant digits**
365	3	41.62	______________
0.057	2	5070.00	______________
403	3	0.00650	______________
63.0040	6	3950	______________
400	1	46.5020	______________
3050	3	.00010	______________

(Note: in scientific notation, all digits are significant - except, of course the 10^y which represents the decimal - $3.000*10^6$ has 4 significant digits)

In calculating with significant figures, the idea is to have no more precision in the answer than in the problem. This results in two basic rules:

1. For addition and subtraction - line up the decimal. Report only the totally known columns

Examples *(solve as in math, then round off to known columns)* .

36.5	10.3	54.1	19.3156	3.007	27.26	4.2
42.40	+5.07	-32.36	+22.524	-.01	-26.25	3.2
29.33	~~15.37~~	21.7~~4~~				+4.3
108.2~~3~~	15.4	21.7				
108.2						

2. For multiplication and division: Count the number of significant figures in both numbers used. The answer should be reported to the least number of significant digits found in the two numbers used.

Examples	**Explanations**
12.3x45.6 = ~~560.88~~ 561	(3 s.f. in both)
11.4x0.9 = ~~10.26~~ 10	(only 1 s.f. in 0.9)
(3.25×10^8) (91.111) = ~~2.9611×10^{10}~~ 2.96×10^{10}	(3 s.f. in 3.25)
$(3.04\times10^4)(1.1\times10^6)$ = ______________________	
$(9.530\times10^9)(4.5\times10^6)$ = ______________________	
(52.6) (3.14) = ______________________	
(0.00007) (52 015 136) = ______________________	
$3.5\times10^4 \div 5.03\times10^8$ = ______________________	
$6.35\times10^{-6}/4.12\times10^{-9}$ = ______________________	