SIGNIFICANT FIGURES

Name _____

easurement can only be as accurate and precise as the instrument that produced it. ientist must be able to express the accuracy of a number, not just its numerical value. We can determine the accuracy of a number by the number of significant figures it contains.

1) **All digits 1-9 inclusive are significant.**
   Example: 129 has 3 significant figures.
2) **Zeros between significant digits are always significant.**
   Example: 5,007 has 4 significant figures.
3) **Trailing zeros in a number are significant only if the number contains a decimal point.**
   Example: 100.0 has 4 significant figures.
   100 has 1 significant figure.
4) **Zeros in the beginning of a number whose only function is to place the decimal point are not significant.**
   Example: 0.0025 has 2 significant figures.
5) **Zeros following a decimal significant figure are significant.**
   Example: 0.000420 has 3 significant figures.
   0.42000 has 5 significant figures.

Determine the number of significant figures in the following numbers.

1. 0.02 1
2. 0.020 2
3. 601 3
4. 601.0 4
5. 5,000 1
6. 5.000 4
7. 6,061.00 6
8. 0.0005 1
9. 0.1020 4
10. 10.001 5

Determine the location of the last significant place value by placing a bar over the digit. (Example: 1.700)

1. 8040 _____
2. 0.0300 _____
3. 699.5 _____
4. 2.000×10^5 _____
5. 0.90100 _____
6. 90,100 _____
7. 4.7×10^4 _____
8. 10,800,000. _____
9. 3.01×10^{21} _____
10. 0.000410 _____

CALCULATIONS USING SIGNIFICANT FIGURES

Name _____

When multiplying and dividing, limit and round to the least number of significant figures in any of the factors.

Example 1: 23.0 cm × 432 cm × 19 cm = 188,784 cm³
The answer is expressed as 190,000 cm³ since 19 cm has only two significant figures.

When adding and subtracting, limit and round your answer to the least number of decimal places in any of the numbers that make up your answer.

Example 2: 123.35 mL + 46.0 mL + 86.257 mL = 255.507 mL
The answer is expressed as 255.5 mL since 46.0 mL has only one decimal place.

Perform the following operations expressing the answer in the correct number of significant figures.

1. 1.35 m × 2.467 m = _____ $3.33\ m^2$
2. 1.035 m² ÷ 42 m = _____ 25 m
3. 12.01 mL + 35.2 mL + 6 mL = _____ 53 mL
4. 55.46 g − 28.9 g = _____ 26.6 g
5. .021 cm × 3.2 cm × 100.1 cm = _____ $6.7\ cm^3$
6. 0.15 cm + 1.15 cm + 2.051 cm = _____ 3.35 cm
7. 150 L³ ÷ 4 L = _____ $40\ L^2$
8. 505 kg − 450.25 kg = _____ 55 kg
9. 1.252 mm × 0.115 mm × 0.012 mm = _____ $0.0017\ mm^3$
10. $1.278 \times 10^3\ m^2 + 1.4267 \times 10^2\ m$ = _____ 8.958 m

Name _____ Date _____ Class _____

MATH HANDBOOK TRANSPARENCY WORKSHEET 3

Significant Figures

Use with Appendix B, Significant Figures

1. For each of the measurements in the table below, determine if the underlined number is significant or not significant. Place a check mark in the appropriate box and in the box under the rule that you used to make your determination.

Measurement	Significant	Not Significant	Rule 1	Rule 2	Rule 3	Rule 4	Rule 5
a. 30<u>3</u>8 m	✓			✓			
b. 1.<u>5</u>11 L	✓		✓				
c. 0.<u>0</u>74 mm		✓				✓	
d. 90<u>5</u>0 s		✓				✓	
e. 3.<u>0</u>07 km	✓				✓		
f. 6.<u>1</u>8°C	✓				✓		
g. 82<u>1</u>.0 g	✓		✓				
h. 0.<u>5</u>60 g		✓				✓	

2. Determine the number of significant figures in each of the following measurements.

a. 56 m 2
b. 1104 mL 4
c. 15 pairs Infinite number
d. 0.20 mol 2
e. 105 000 mm 3
f. 6.02 L 3
g. 0.176 kPa 3
h. 130 000.0 g 7
i. 4.090 m^2 4
j. 0.005 42 s 3
k. 49 000 km 2
l. 7.81 kg 3
m. 7.01 m/s 3
n. 0.0021 m 2
o. 30.015 g 5
p. 90 km 1
q. 12.0 m 3
r. 0.0505 kPa 3
s. 50 grams Infinite number
t. 13.90 m/s^2 4
u. 0.100 50 cg 5
v. 0.05 10 kg 3
w. 6.12×10^5 mm 3
x. 4.01×10^2 s 3
y. $60\,000 \times 10^{-3}$ g 1
z. 1.000×10^3 kPa 4

Sorry it's so blurry ☹