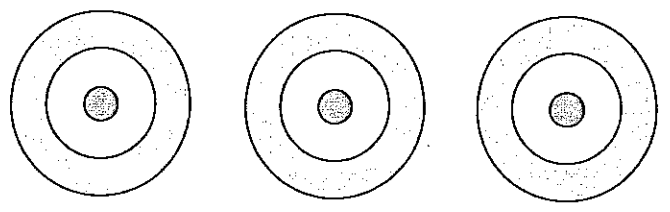


**RULE: Going From THE DECIMAL POINT TO THE LEFT**  
 ANY ZEROS ARE NOT SIGNIFICANT UNTIL YOU  
 HIT A NON-ZERO. **EX. 1001 = (4) SIG. FIGS.**

Unit 1: Introduction  
**3 - Sig Figs**

**Accuracy:** How CLOSE A MEASURED VALUE IS TO THE CORRECT / ACCEPTED VALUE  
**Precision:** How REPRODUCIBLE YOUR MEASUREMENTS ARE. # WITH MORE DIGITS ARE CONSIDERED TO BE PRECISE



- When making a measurement, the last digit is always UNCERTAIN = BEST GUESS
- All recorded data is considered SIGNIFICANT, however the last digit is deemed UNCERTAIN.
- A measuring instrument generally has a precision of...  
 $\pm 0.5$  OF ITS SMALLEST DIVISION

Ex.  
 Measure the width of the bench

The Sig Fig Rules

- 1) All non-zero numbers...**  
 Ex: 321 has 3 sig figs
- 2) Zeroes that occur...**  
 Ex: 1001 has 4 sig figs
- 3) In a non-decimal number...**  
 Ex: 5200 has 2 sig figs
- 4) Zeroes to the left...**  
 Ex: 0.0085 has 2 sig figs
- 5) In a decimal number...**  
 Ex: 0.2500 has 4 sig figs

*NO DECIMAL POINT START AT RIGHT AND START TO COUNT AT FIRST NON-ZERO*

WHEN IT HAS A DECIMAL, YOU COUNT THOSE EXTRA ZEROS!

Examples: How many sig figs are in each number?

- |                  |                 |                    |                   |
|------------------|-----------------|--------------------|-------------------|
| 1) 1500<br>(2)   | 2) 2021<br>(4)  | 3) 0.34<br>(2)     | 4) 0.0039<br>(2)  |
| 5) 50 000<br>(5) | 6) 0.800<br>(3) | 7) 0.000360<br>(3) | 8) 1200.00<br>(2) |

Multiplying and Dividing

- When multiplying or dividing numbers, our final answer is always ...

Ex:  $350 \times 1.15 = 402.5 = 403$   
 $200.0 \times 150 = 30000$   
 $0.002695 \times 100 = 0.2695 = 0.3$

Adding and Subtracting

- When adding or subtracting numbers, our final answer is always ...

Ex:  $25 + 57.65 = 82.65 = 83$   
 $0.6851 - 0.337 = 0.3481 = 0.348$   
 $5.024 - 5.01 = 0.0140$

## Worksheet 1.3 – Significant Figures

1) Counting sig figs: write down the number of sig figs each piece of data has:

a) 0.0021 m

d) 410 kg

b) 200,000 m<sup>3</sup>

e) 0.0002 s

c) 21.200 s

f) 91.0001 m<sup>2</sup>

2) Multiplication with sig figs:

a) 92.45 m · 1.01 m =

e) 0.00698 m<sup>2</sup> · 100 cm =

b) 0.0024 N · 4.24 s =

f) 2001 kg · 12.6 m/s =

c) 4000 kg · 2.001 m/s

g) 610 N · 4002 s =

3) Division with sig figs:

a) 12 m ÷ 31.2 s =

d) 1800 kg ÷ 410 s =

b) 69.4 kg ÷ 38.888 s =

e) 0.102 m ÷ 100 ms =

c) 0.012 m<sup>2</sup> ÷ 0.0002 s =

f) 1001 m<sup>3</sup> ÷ 40 ks =

4) Addition and subtraction with sig figs:

a) 14 m + 12.2 m =

d) 69.45 s + 19.3 s =

b) 0.012 kg + 1.0046 kg – 0.0064 kg =

e) 200.1 m – 128.28 m =

c) 12.46 kg + 9.82 kg – 6.666 kg =

5) Chain calcs with sig figs: write down the number of sig figs each piece of data has:

a) (0.045 m · 9.92 kg) ÷ 16.86 s =

b) (9000 m · 4.01 m) · 1.002 m =

c) (0.21 m · 6.23 s) · 1.002 m =

d) (18.01 m · 0.41 m) ÷ (14.62 kg · 12 s) =