

Measurements and Calculations**Name:**

1. State the number of significant digits in each measurement.

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|----------------------|----------------------------------|------------------------------------|
| 1) 2804 m | 2) 2.84 km | 3) 5.029 m |
| 4) 0.003068 m | 5) 4.6 x 10⁵ m | 6) 4.06 x 10⁻⁵ m |
| 7) 750 m | 8) 75 m | 9) 75,000 m |
| 10) 75.00 m | 11) 75,000.0 m | 12) 10 cm |

2. Round the following numbers as indicated:

To four significant figures:

3.682417	21.860051	375.6523	112.511	45.4673
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To one decimal place:

1.3511	2.473	5.687524	7.555	8.235
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To two decimal places:

22.494	79.2588	0.03062	3.4125	41.86632
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3. Solve the following problems and report answers with appropriate number of significant digits.

- 1) **6.201 cm + 7.4 cm + 0.68 cm + 12.0 cm =**
- 2) **1.6 km + 1.62 m + 1200 cm =**
- 3) **8.264 g - 7.8 g + 0.254 g + 56 g =**
- 4) **10.4168 m - 6.0 m + 72.23 cm =**
- 5) **12.00 m + 15.001 kg =**
- 6) **1.31 cm × 2.3 cm × 0.001 cm =**
- 7) **5.7621 m × 6.201 m × 7.01 m × 2100m =**

8) $20.2 \text{ cm} / 7.41 \text{ s} =$

9) $40.002 \text{ g} / 13.000005 \text{ g} =$

4. Express the following numbers in their equivalent standard notational form:

1) $123,876.3$

2) $1,236,840$

3) 422000

4) 0.000000000000211

5) 0.000238

6) 0.0000205

5. Identify the sums or differences of the following:

1) $(8.41 \times 10^4) + (9.71 \times 10^4) =$

2) $(5.11 \times 10^2) - (4.2 \times 10^3) =$

3) $(8.2 \times 10^3) + (4.0 \times 10^5) =$

4) $(6.3 \times 10^{-1}) - (2.1 \times 10^{-2}) =$

6. Express the product and the quotients of the following:

1) $(3.56 \times 10^5) (4.21 \times 10^6) =$

2) $(2 \times 10^7) (8 \times 10^{-9}) =$

3) $(4.11 \times 10^{-6}) (7.51 \times 10^{-4}) =$

4) $8.45 \times 10^7 / 6.74 \times 10^3 =$

5) $9.7 \times 10^8 / 8.6 \times 10^{-2} =$

6) $4.7 \times 10^{-2} / 5.7 \times 10^{-6} =$

Dimensional analysis (Factor-Label Method)

1. Calculate the height of a 5 foot 10 inch man in m, mm, and cm.
2. Calculate the volume of a fish tank in L, mL, cc, qt. and gal. if it is 0.85 m long, 25 cm wide, and 20 cm high.
3. Calculate the number of kg, g, and mg in 0.25 lb of margarine.
4. A box measures 3.12 ft in length, 0.0455 yd in width and 7.87 inches in height. What is its volume in cubic centimeters?
5. How many μg are there in 5.27×10^{-13} kg?
6. Convert 65 miles/hour to meters/second.

7. What is the density of mercury (13.6 g/cm^3) in units of kg/m^3 ?

8. Convert 15 years to minutes.

1 in = 2.54 cm

1 ft = 12 in

1 qt = 0.946 L

1 gal = 3.785 L

1 lb = 454 g

1 mi = 1609 m

1 yd = 3 ft

Micro (μ) = 10^{-6}

Additional problems:

1. Convert to Celsius and to Kelvin:

a) 320°F

b) 212°F

c) -250°F

d) 0°F

2. Convert to Fahrenheit and to Kelvin:

a) 35°C

b) 250°C

c) -273°C

d) 120°C

3. The density of titanium is 4.54 g/mL . What is the volume, in millimetres, of 163 kg of titanium?