

Practice Worksheet for Significant Figures

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

- 1) 2804 m 4 2) 2.84 km 3 3) 5.029 m 4
 4) 0.003068 m 4 5) 4.6×10^5 m 2 6) 4.06×10^{-5} m 3
 7) 750 m 2 8) 75 m 2 9) 75,000 m 2
 10) 75.00 m 4 11) 75,000.0 m 6 12) 10 cm 1

2. Round the following numbers as indicated:

To four figures:

- 3.682417 21.860051 375.6523 112.511 45.4673
 3.682 21.86 375.7 112.5 45.47

To one decimal place:

- 1.3511 2.473 5.687524 7.555 8.235
 1.4 2.5 5.7 7.6 8.2

To two decimal places:

- 22.494 79.2588 0.03062 3.4125 41.86632
 22.50 79.26 0.03 3.41 41.87

3. Solve the following problems and report answers with appropriate number of significant digits.

1) $6.201 \text{ cm} + 7.4 \text{ cm} + 0.68 \text{ cm} + 12.0 \text{ cm} = 26.3 \text{ cm}$

~~$2 \times 1.6 \text{ km} + 1.62 \text{ m} + 1200 \text{ cm} = 4.822 \text{ km}$~~

3) $8.264 \text{ g} - 7.8 \text{ g} = 0.5 \text{ g}$

4) $10.4168 \text{ m} - 6.0 \text{ m} = 4.4 \text{ m}$

5) $12.00 \text{ m} + 15.001 \text{ kg} = \text{can't add length to mass}$

6) $1.31 \text{ cm} \times 2.3 \text{ cm} = 3.0 \text{ cm}^2$

7) $5.7621 \text{ m} \times 6.201 \text{ m} = 35.73 \text{ m}^2$

8) $20.2 \text{ cm} / 7.41 \text{ s} = 2.73 \text{ cm/s}$

9) $40.002 \text{ g} / 13.000005 \text{ g} = 3.0771$

4. Express the following numbers in their scientific notation form:

1) 123,876.3 1.238763×10^5

2) 1,236,840 1.23684×10^6

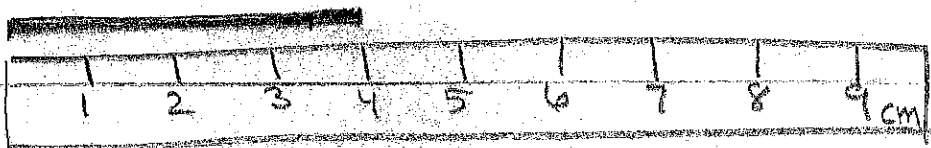
3) 422000 4.22000×10^5

4) 0.0000000000000211 2.11×10^{-13}

5) 0.000238 2.38×10^{-4}

6) 0.0000205 2.05×10^{-5}

What is the correct measurement for each?



4.0 cm



1.32 cm

Metric Mania

Name _____

LENGTH:

1. What is the basic unit for length? m

2. Circle the best unit for measuring each distance:

a. Thickness of an eyelash: mm cm m

b. Length of a pencil: cm m km

4. Convert the following measurements:

a. 34 mm = 3.4 cm

b. 3 km = 3000 m

c. 234 cm = 2.34 m

d. 35 m = 35000 mm

MASS:

5. What is the basic unit for mass? kg or g *for formulas*

6. Circle the best unit for measuring each mass:

a. Amount of spices in a batch of cookies: mg g kg

b. Your mass: mg g kg

c. Mass of 10 pennies: mg g kg

for "base" step on ladder

8. Convert the following measurements:

a. 16 mg = .016 g

b. 4.7 kg = 4700 g

c. 12,345 g = 12.345 kg

d. 2 g = 2000 mg

VOLUME:

19. What is the basic unit for volume? L

20. Circle the best unit for measuring each volume:

a. Amount of soda in 1 can: mL L

b. Water in a bathtub: mL L

22. Convert the following measurements:

a. 160 mL = .16 L

b. 23 kL = 23000 L

c. 456 cL = 4560 mL

c. 120 mL = 120 cm³

TIME:

23. What is the basic unit for measuring time? S

24. How many seconds are in:

a. 1 minute? 60

b. 6 hours? 21600 S

c. 2 days? 172800 S

assume counts

$$\frac{6h}{1} \times \frac{60min}{1h} \times \frac{60s}{1min}$$

$$\frac{2days}{1} \times \frac{24hr}{1day} \times \frac{60min}{1hr} \times \frac{60s}{1min}$$

Temperature Conversion

Example: Convert 36 °C into Kelvin.

$K = C + 273.15$ ~~~~~ *don't worry @ .15*

Using this formula, $K = 36 + 273.15 = 309.15$ K

A) Convert Celsius into Kelvin

1) 49 °C = 322 K

2) 27 °C = 300 K

3) 62 °C = 335 K

4) 81 °C = 354 K

5) 56 °C = 329 K

6) 12 °C = 285 K

7) 33 °C = 306 K

8) 70 °C = 343 K

Example: Convert 284 K into °C.

$C = K - 273.15$

Using this formula, $C = 284 - 273.15 = 10.85$ °C

B) Convert Kelvin into Celsius

1) 351 K = 78 °C

2) 302 K = 29 °C

3) 276 K = 3 °C

4) 344 K = 71 °C

5) 368 K = 95 °C

6) 327 K = 54 °C

7) 336 K = 63 °C

8) 290 K = 17 °C

1-5 Density Worksheet

7. A shoe box

mass = 114.0 g volume = 538.5 cm³

Show work:

density = $\frac{114.0g}{538.5cm^3} = 0.2117g/cm^3$

8. a rock

mass = 22.3 g volume = 8.0 cm³

Show work:

density = $\frac{22.3g}{8.0cm^3} = 2.8g/cm^3$

9. A full soda bottle

mass = 609.0 g volume = 591.0 mL

Show work:

density = $\frac{609.0g}{591.0mL} = 1.030g/mL$

10. a dry sponge

mass = 54.2 g volume = 78.1 cm³

Show work:

density = $\frac{54.2g}{78.1cm^3} = 0.694g/cm^3$

11. If you empty out the soda bottle from questions #9. Which measurement, mass or volume, changes the most? Explain.

loss liquid
from inside
replaced w/
less dense
air = less
mass

same
amount
of space
taken
up
by bottle

12. If the empty soda bottle is 590,g less than it was full, what is the new density of the soda bottle?

Show your work!

$609g - 590g = 19g$
 m_1 $m_2 \text{ pop}$

$D = \frac{m}{V}$

$\frac{19g}{591.0mL}$

$0.032 g/mL$

13. If the dry sponge from question 10 absorbs 280,grams of water, will it be more dense or less dense? Explain.

$54.2 + 280. = 334.2 = 334g$

$D = \frac{M}{V} = \frac{334g}{78.1cm^3} = 4.28 g/cm^3$

PERCENT ERROR WORKSHEET

1. Joshua uses his thermometer and finds the boiling point of ethyl alcohol to be 75.0° C. He looks in a reference book and finds that the actual boiling point of ethyl alcohol is 80.0° C. What is his percent error?

experimental \swarrow *actual*

$$\% \text{ error} = \frac{|\text{exper} - \text{actual}|}{\text{actual}}$$
$$= \frac{|75.0 - 80.0|}{80.0} = \frac{5.0}{80.0} = .063$$

$= 6.3\%$

2. The density of water at 4.00 °C is known to be 1.000g/mL. Kayla experimentally found the density of water to be 1.075 g/mL. What is her percent error?

-actual
exper.

$$\% = \frac{|1.075 - 1.000|}{1.00} = \frac{.075}{1.00} = .075$$

$= 7.5\%$

3. An object has a mass of 35.0 grams. On Anthony's balance, it weighs 34.85 grams. What is the percent error of his balance?

-actual

exp.

$$\% = \frac{|34.85 - 35.00|}{35.0} = \frac{.15}{35.0} = .004285$$

$= .43\%$