

Measurement Review

ALL ANSWERS MUST INCLUDE THE PROPER UNITS AND NUMBER OF SIG FIGS

CALCULATE PERCENT ERROR FOR THE FOLLOWING VALUES:

1. Marisa determined the melting point of a substance to be 24.5°C. Find the percent error of her measurement if the actual melting point is 31.2°C.
2. The molar mass of butane is 58.14 g/mol. Using his lab data, Tyrone calculated the molar mass of butane as 44.2 g/mol. Find the percent error of his measurement.

DETERMINE THE NUMBER OF SIGNIFICANT FIGURES IN THE FOLLOWING NUMBERS:

- | | |
|---------------|-------------------------|
| 3. 320,000 mm | 5. 5,000 km |
| 4. 0.0400 g | 6. 68,050 μL |

CONVERT THE FOLLOWING NUMBERS INTO OR OUT OF SCIENTIFIC NOTATION:

- | | |
|----------------------|-----------------------------|
| 7. 0.000506 mL | 9. 5.00×10^{-3} km |
| 8. 42,000,000,000 pm | 10. 8.200×10^2 m |

CALCULATE AND EXPRESS ANSWERS IN THE CORRECT UNITS AND # OF SIG FIGS.

- | | |
|--|--|
| 11. $(0.00600 \text{ m}) \div (0.030 \text{ s}) =$ | 14. $(5,200 \text{ cm}) (0.07 \text{ cm}) =$ |
| 12. $(167.55 \text{ g}) - (87.3 \text{ g}) =$ | 15. $(12.5 \text{ g}) \div (6.0 \text{ g/cm}^3) =$ |
| 13. $(50.75 \text{ mL}) + (155 \text{ mL}) =$ | 16. $(370 \text{ mg}) + (1200 \text{ mg}) =$ |

SOLVE THE FOLLOWING DENSITY PROBLEMS:

17. Limestone has a density of 2.72 g/cm³. What is the mass of 24.9 cm³ of limestone?
18. Helium has a density of 0.017 g/L. What is the volume of a weather balloon that contains 38 g of helium?
19. A 0.750-cm³ sample of platinum has a density of 21.4 g/cm³. What is its mass?

PERFORM THE FOLLOWING SI UNIT CONVERSIONS (watch sig figs!):

- | | |
|--------------------|-----------------------------------|
| 20. 177 mL = ___ L | 22. 0.093 kg = ___ mg |
| 21. 56 m = ___ cm | 23. 54,400 μm = ___ dm |

USE THE FACTOR-LABEL METHOD TO SOLVE THE FOLLOWING PROBLEMS:

24. George walks 1.5 km to school. If each step he takes is equal to 2.25 ft, how many steps does he take?
25. Susanna is 5.50 ft tall. What is her height in centimeters?
26. A can of Diet Pepsi[®] contains 355 mL of soda. How many cans would have to be opened in order to fill a 1.0-m³ tank?
27. How many milliliters are in a 20.0-oz. bottle of soda? (There are 32 oz. in 1 quart.)
28. An ant is about 4.0 mm long. How many ants does it take to span 2.0 feet?
29. One serving of Jello[®] instant pudding requires 28.0 g of mix. If each box contains 107 g of mix, how many boxes are required to serve 15 people?
30. How many pounds does 1.0 quart of motor oil weigh if the density of motor oil is 0.80 g/mL?

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ANSWER KEY

***ALL ANSWERS MUST INCLUDE THE PROPER UNITS AND
NUMBER OF SIG FIGS***

- | | |
|-----------------------------|-----------------|
| 1. 21% <i>or</i> 21.5% | 16. 1600 mg |
| 2. 23.9% <i>or</i> 24.0% | 17. 67.7 g |
| 3. 2 | 18. 2,200 L |
| 4. 3 | 19. 16.1 g |
| 5. 1 | 20. 0.177 L |
| 6. 4 | 21. 5,600 cm |
| 7. 5.06×10^{-4} mL | 22. 93,000 mg |
| 8. 4.2×10^{10} pm | 23. 0.544 dm |
| 9. 0.00500 km | 24. 2,200 steps |
| 10. 820.0 m | 25. 168 cm |
| 11. 0.20 m/s | 26. 2800 cans |
| 12. 80.3 g | 27. 591 mL |
| 13. 206 mL | 28. 15 ants |
| 14. 400 cm^2 | 29. 3.93 boxes |
| 15. 2.1 cm^3 | 30. 1.7 lbs |