

KEY

Operations with Significant Digits & Scientific Notation

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

- (a) 2804 m ⁴ (c) 0.0029 m ² (e) 4.6 X 10⁵ m ²
 (b) 2.84 m ³ (d) 0.003068 m ⁴ (f) 4.06 X 10⁵ m ³

2. State the number of significant digits in each measurement:

- (a) 75 m ² (c) 0.007 060 kg ⁴ (e) 1.008 X 10⁵ m ⁴
 (b) 75.00 cm ⁴ (d) 1.87 X 10⁶ m ³ (f) 1.20 X 10⁻⁴ m ³

3. Add: 6.201 cm + 7.4 cm + 0.68 cm + 12.0 cm = 26.281 = 26.3 cm

4. Add: 28.662 m + 32.34 m + 17.5 m = 78.502 = 78.5 m

5. Add: 26.38 kg + 14.531 kg + 30.8 kg = 71.711 = 71.7 kg

6. The sides of a rectangular plot of land are measured. The lengths are found to be 132.68 m, 48.3 m, 132.736 m, and 48.37 m. What is the perimeter of the plot of land as can best be determined with these measurements = 362.086 = 362.1 m

7. Subtract: 10.8 g - 8.264 g = 2.536 = 2.5 g

8. Subtract: 44.12 ml - 28.82 ml = 15.3 = 15.30 mL

9. A tank has a mass of 3.64 kg when empty and a mass of 51.8 kg when filled to a certain level with water. What is the mass of the water in the tank?

51.8 - 3.64 = 48.16
 = 48.2 kg

10. Multiply:

- (a) 1.31 cm x 2.3 cm = 3.013 = 3.0 cm²
 (b) 6.87 cm x 2.2 cm = 15.114 = 15 cm²
 (c) 3.2145 km x 4.23 km = 13.6 km²

11. Divide:

- (a) 20.2 cm ÷ 7.41 cm = 2.7260 = 2.73 ~~cm~~
 (b) 3.1416 cm ÷ 12.4 cm = 0.25335 = 0.253
 (c) 64.39 m ÷ 13.6 m = 4.73455 = 4.73

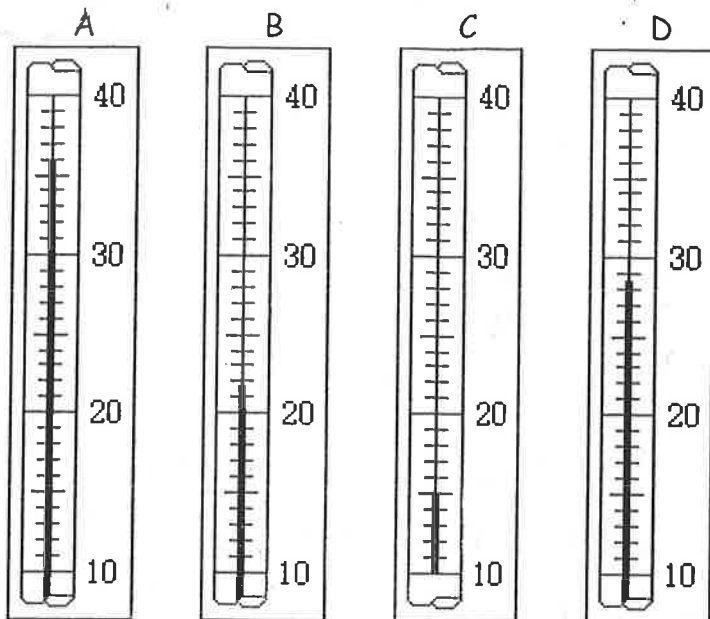
} NO
 UNITS

12. Measurements of a rectangular floor show the length is 15.72 m and the width is 4.40 m. Calculate the area of the floor to the best possible value using these measurements.

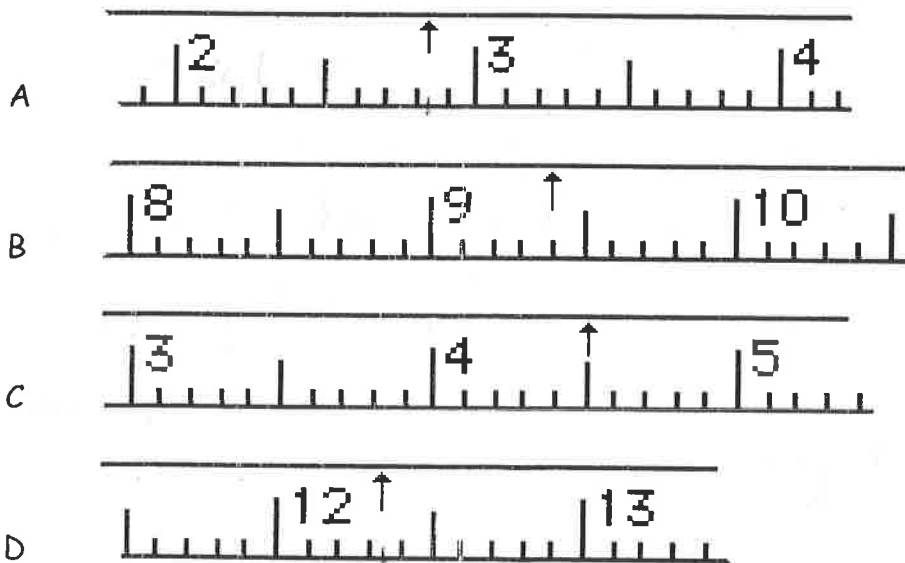
A = L · W
 = (15.72 m)(4.40 m)
 = 55.968
 A = 56.0 m²

More on Sig Figs: Practice Reading Scales

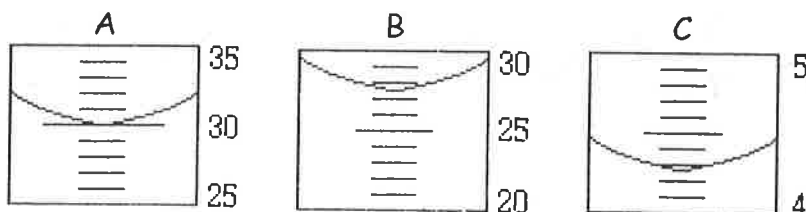
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Thermometer	Temperature Reading (°C)
A	36.0
B	21.7
C	15.0
D	28.6



Ruler	Length Reading (cm)
A	2.83
B	9.40
C	4.51
D	12.33



Graduated Cylinder	Volume Reading (mL)
A	30.0
B	27.5
C	4.27

12300g

13. Add: 12.3(kg) + 21.3g + 13.5g + 9.04g = ~~55.14~~ 12343.84g = 12300g = 12.3kg HA!

14. Re-express each of the following calculations in scientific notation, perform the calculation and express the answer in scientific notation.

SEE BELOW

- a) 60×80
- b) 180×20
- c) $2,000 \times 170$
- d) $12 \times 5,000$
- e) $480 \div 60$
- f) $18,000 \div 200$
- g) $15,400 \div 220$
- h) $3,060,000 \div 6,000$
- i) $2,040 \div 80.00$

15. Perform each of the following calculations and express the answer in scientific notation with the proper number of significant digits.

SEE BACK

- a) $(4.3 \times 10^2) \times (2.0 \times 10^3)$
- b) $(8.6 \times 10^4) \div (4.30 \times 10^2)$
- c) $(9.060 \times 10^{-3}) \times (3.00 \times 10^7)$
- d) $(9.060 \times 10^{-3}) \div (3.02 \times 10^7)$
- e) $(4.12 \times 10^8) \times (2.06 \times 10^{-3})$
- f) $(6.25 \times 10^8) \div (2.1 \times 10^{-3})$
- g) $(4.60 \times 10^8) \times (6.0 \times 10^4)$
- h) $\frac{(2.3 \times 10^6) \times (3.00 \times 10^2)}{4.060 \times 8.4 \times 10^{-2}}$
- i) $\frac{0.008 \times 4.306.2}{4 \times 10^{-7}}$

* IT'S A COMMA!
SORRY

16. Be careful with these!

a) $\frac{43.57}{1.6} + \frac{454.2}{5.6} = 27.231 + 81.107 = 108.338 = 108$

b) $\frac{(627 - 4.2)(18.7)}{1234 - 65} = \frac{(622.8)(18.7)}{1169} = 9.9626 = 9.96$

c) $\{22^{-1} + (-18.4)^{-1}\}^{-1} = 100$ (OR 1×10^2)

14 a) $60 \times 80 = (6.0 \times 10^1)(8.0 \times 10^1) = 4.8 \times 10^3$

b) $180 \times 20 = (1.8 \times 10^2)(2.0 \times 10^1) = 3.6 \times 10^3$

c) $2000 \times 170 = (2.00 \times 10^3)(1.7 \times 10^2) = 3.4 \times 10^5$

d) $(1.2 \times 10^1)(5 \times 10^3) = 6 \times 10^4$

e) $(4.8 \times 10^2)(6 \times 10^1) = 3 \times 10^4$

f) $(1.8 \times 10^4) / (2 \times 10^2) = 9 \times 10^1$

g) $(1.54 \times 10^4) / 2.2 \times 10^2 = 7.0 \times 10^1$

h) $3.06 \times 10^6 / 6.0 \times 10^3 = 5.1 \times 10^2$

i) $2.04 \times 10^3 / 8.000 \times 10^1 = 2.55 \times 10^1$

15 a) 8.6×10^5

b) 2.0×10^2

c) 2.72×10^5

d) 3.00×10^{-10}

e) 8.49×10^5

f) 3.0×10^{11}

g) 4.0×10^4

h) 1.7×10^0

i) ~~8.4~~ 9×10^7