La Scuola d'Italia / Huson / Physics   First & last name:
4 November 2025   Grade:

2.1 PreTest: Precision, Scientific Notation, Vectors, Kinematics Intro

1. Round each value to three significant figures.

   (a) 0.003297 m

   (b) 93.085 kg

   (c) 5.9998 s

   (d) 12,450 N

2. Write each number in proper scientific notation ($1 \le a < 10$).

   (a) 0.00045

   (b) 38,200

   (c) 602,000,000

   (d) 0.00875

3. Express in standard (long) form.

   (a) 6.07×10^{-4}

   (b) 1.002×10^{5}

4. Perform each operation and give the answer to 3 significant figures.

   (a) $(3.2 \times 10^{3}) + (7.5 \times 10^{2})$

   (c) $\dfrac{4.5 \times 10^{5}}{9.0 \times 10^{2}}$

   (b) $(6.40 \times 10^{-2}) \times (2.5 \times 10^{3})$

5. A board's width is measured as 12.4 ± 0.2 cm.

   (a) What is the range of possible values?

   (b) What is the percent uncertainty? (show work)

6. A mass is measured as 0.815 kg with an uncertainty of ±0.005 kg.

   (a) Calculate the percent uncertainty.

   (b) Which measurement (the board or this mass) is more precise? Explain briefly.

Unit Conversions

7. Convert each value. Show one line of work using unit factors.

   (a) 2.35 m to cm   (d) 0.650 kg to g

   (b) 7.20 km to m   (e) 4.20×10^3 g to kg

   (c) 18.0 in to cm   (1 in = 2.54 cm)   (f) 15.5 lb to kg   (1 lb = 0.454 kg)

8. Convert each speed.

   (a) 55.0 mi/h to m/s   (1 mi = 1609 m)

   (b) 4.20 m/s to km/h

   (c) A car moves at 22.5 m/s. How long does it take to travel 1.00 km?

La Scuola d'Italia / Huson / Physics
4 November 2025

First & last name:
Grade:

Order of Magnitude Estimation

9. Choose the best order of magnitude.

    (a) Mass of a textbook: A) 10^{-3} kg   B) 10^{-1} kg   C) 10^0 kg   D) 10^2 kg

    (b) Length of a classroom: A) 10^{-2} m   B) 10^0 m   C) 10^1 m   D) 10^3 m

    (c) Time for light to cross 10 m: A) 10^{-8} s   B) 10^{-6} s   C) 10^{-3} s   D) 10^0 s

One-Dimensional Motion and Vectors

10. A student walks along a straight hallway (forward is +). Start $x_0 = 2.0$ m.

    (a) To $x = 7.5$ m, find displacement Δx.

    (b) From $x = 7.5$ m back to $x = 4.0$ m, find Δx.

    (c) Total displacement from start to finish.

11. A cart moves from $x_1 = 1.2$ m at $t_1 = 0.0$ s to $x_2 = 5.8$ m at $t_2 = 3.0$ s.

    (a) Find displacement.

    (b) Find average velocity v_{avg}.

    (c) State the units for v_{avg}.

12. A cyclist rides east, then west:

    (a) From $x = 0$ m to $x = 30$ m in 12 s.

    (b) Then back to $x = 18$ m at $t = 20$ s.

    (c) Find each displacement, total displacement, and total distance traveled.

13. One-dimensional vector additions (east is $+$).

   (a) $\Delta x_1 = +12$ m, $\Delta x_2 = -5$ m   (b) $+0.85$ km, $+1.40$ km, -0.50 km

   Why is distance not always equal to displacement?

14. A car travels at 88 km/h. The driver looks away for 1.6 s.

   (a) Convert 88 km/h to m/s.

   (b) How far does the car move in 1.6 s?

15. A cart starts from rest and accelerates at 0.80 m/s^2.

   (a) Find its speed after 5.0 s.

   (b) Interpret physically what 0.80 m/s^2 means.

   (c) If displacement is 10.0 m, find average velocity.

16. A drone flies north at 12.0 m/s for 45.0 s.

   (a) Convert 12.0 m/s to km/h.

   (b) Find distance traveled.

   (c) If south is negative, what sign would you assign to this displacement?