

Friday warm-up: units, vectors, and introductory calculus

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1 Chapter 1 - Unit analysis, Estimation

- Which of the following are correct?
 - A: The quantity m s^{-1} is a unit of acceleration.
 - B: The quantity m s^{-1} is a unit of speed.
 - C: The quantity m s^{-2} is a unit of speed.
 - D: The quantity m s^{-2} is a unit of acceleration.
- Which of the following represents the density of lead?
 - A: 0.11 g cm^{-3}
 - B: 1.1 g cm^{-3}
 - C: 11 g cm^{-3}
 - D: 111 g cm^{-3}
- If there are 2.2 lbs/kg, which of the following is equivalent to 100 lbs in kg?
 - A: 220 kg
 - B: 100 kg
 - C: 45.5 kg
 - D: 10.5 kg
- A train leaves Los Angeles Union Station for the Bay Area (Evansville) at 60 km/hr. If the Bay Area (Evansville) is 600 km to the North, how long before the train reaches the destination?
 - A: 1 hour
 - B: 10 hours
 - C: 15 hours
 - D: 24 hours
- In the previous problem, the *magnitude* of \vec{v} is 10 km/hr. This is because
 - A: $\sqrt{7.1} = 10$
 - B: $\sqrt{7.1^2} = 10$
 - C: $\sqrt{7.1^2 + 7.1^2} = 10$
 - D: $2\sqrt{7.1^2} = 10$
- Suppose $\vec{x}_1 = (2, 3) \text{ km}$ and $\vec{x}_2 = (-2, 3) \text{ km}$. What is $\vec{x}_1 + \vec{x}_2$?
 - A: (6,0) km
 - B: (0,6) km
 - C: (4,0) km
 - D: (0,4) km

2 Chapter 2 - Vectors

- Let (v_x, v_y) represent the x and y-components of a vector \vec{v} . The wind velocity is 10 km/hr, Southwest. North and East vector components are positive, while South and West are negative. Find \vec{v} below.
 - A: (7.1,7.1) km/hr
 - B: (-7.1,7.1) km/hr
 - C: (7.1,-7.1) km/hr
 - D: (-7.1,-7.1) km/hr