



Physics Olympiad and Problem Solving Programs
N210 - Introductory Physics Olympiad
Problem Set 2.2 - Mock Exam: Kinematics Solutions

Name:

Date:

Instruction: This is a self-proctored, *closed-book* mock exam. You have 15 minutes to answer the following questions.

1. C. Displacement refers to the position of a moving object. Here, the displacement is 0.
2. D.
3. C. $a = \frac{40 - 20}{4} = \boxed{5 \text{ m/s}^2}$.
4. C. The displacement is 30 meters to the north and 40 meters to the east. Therefore, the final displacement is 50 meters.
5. D. Assume the sprinter run t seconds in the first 50 meters, we have $v = at$ and $50 = \frac{1}{2}at^2$. In the second 50 meters, the sprinter run in constant velocity so $50 = v(10 - t) = 10v - at^2 = 10v - 100$. Thus, $v = 15 \text{ m/s}$.
6. B.
7. C. In one hour, the displacement 120 km due north and 50 km due east. From geometry, we know the magnitude of the displacement is 130 km.
8. E.