

Physics 112/111
ICA: Velocity vs. Time Graph #1

18 #3

Name - Key

Date - Feb 22/13

SHOW YOUR WORK ON YOUR OWN PAPER.
Use north or south to indicate the directions of vector quantities.
Report all answers to three significant digits.

1. The maximum velocity of the object is 16.0 m/s, N. (1)
2. What is the velocity of the object at $t = 75$ s? 4.00 m/s, S (1)
3. What is the acceleration of the object at $t = 110$ s? 0.640 m/s², N (2)
4. How much time does the object spend traveling north? 70.0 s south? 80.0 s (2)
5. What is the displacement of the object after 160 s? 70.0 m, S (3)
6. What is the average velocity of the object for the 160 s trip? 0.438 m/s, S (2)
7. The maximum speed of the object is 16.0 m/s (1)
8. What is the average speed of the object during the 160 s trip? 7.44 m/s (2)
9. The total time that the object is stopped is 10.0 s (1)
10. What is the average acceleration of the object between 20 s and 75 s? 0.0364 m/s², N (2)
11. At what time, if any, did the object reverse its direction? 90.0 s (1)

3. $(90, 0), (115, 16)$

$$\frac{16 - 0}{115 - 90} = 0.640 \text{ m/s}^2$$

5. $A_1 = \frac{1}{2}(80 + 25)(12) = 630 \text{ m}$
 $A_2 = \frac{1}{2}(70)(16) = 560 \text{ m}$
 $d = -630 \text{ m} + 560 \text{ m} = -70.0 \text{ m}$

6. $\bar{v} = \frac{-70.0 \text{ m}}{160 \text{ s}} = -0.438 \text{ m/s}$

7. $v = \frac{630 + 560}{160} = 7.44 \text{ m/s}$

10. $(20, -6), (75, -4)$

$$\frac{-6 + 4}{20 - 75} = 0.0364 \text{ m/s}^2$$