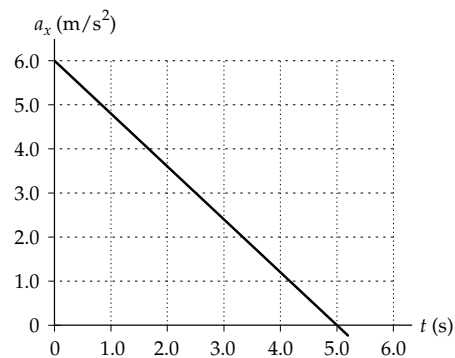


1 □ The answer to a question is  $[MLT^{-1}]$ . The question is “What are the dimensions of

- a.  $mr?$ ”
- b.  $mvr?$ ”
- c.  $ma?$ ”
- d.  $mat?$ ”
- e.  $\frac{mv^2}{r}?$ ”

answer: d

2. At  $t = 0$ , a particle is located at  $x = 25$  m and has a velocity of 15 m/s in the positive  $x$  direction. The acceleration of the particle varies with time as shown in the diagram. What is the velocity of the particle at  $t = 5.0$  s?



- a. +15 m/s
- b. -15 m/s
- c. +30 m/s
- d. 0
- e. -1.2 m/s

answer: c

3. Given that  $\vec{A} + 2\vec{B} = x_1\hat{i} + y_1\hat{j}$  and  $2\vec{A} - \vec{B} = x_2\hat{i} + y_2\hat{j}$ , what is  $\vec{A}$ ?

- a.  $\vec{A} = \frac{1}{5}(x_1 + 2x_2)\hat{i} + \frac{1}{5}(y_1 + 2y_2)\hat{j}$ .
- b.  $\vec{A} = \frac{1}{5}(x_1 - 2x_2)\hat{i} + \frac{1}{5}(y_1 - 2y_2)\hat{j}$
- c.  $\vec{A} = \frac{1}{5}(x_1 + 4x_2)\hat{i} + \frac{1}{5}(y_1 + 2y_2)\hat{j}$
- d.  $\vec{A} = \frac{1}{5}(x_1 + 4x_2)\hat{i} + \frac{1}{5}(y_1 + 4y_2)\hat{j}$
- e.  $\vec{A} = \frac{1}{5}(x_1 + 4x_2)\hat{i} + \frac{1}{5}(y_1 - 4y_2)\hat{j}$

answer: a

4. A particle starts from the origin at  $t = 0$  with a velocity of  $6.0 \hat{\mathbf{i}}$  m/s and moves in the  $xy$  plane with a constant acceleration of  $(-2.0 \hat{\mathbf{i}} + 4.0 \hat{\mathbf{j}})$  m/s<sup>2</sup>. At the instant the particle achieves its maximum positive  $x$  coordinate, how far is it from the origin?
- a. 36 m
  - b. 20 m
  - c. 45 m
  - d. 27 m
  - e. 37 m

answer: b

5. While the gondola is rising at a speed of 2.0 m/s, a passenger in a balloon-supported gondola throws a small ball down at a speed of 5.0 m/s relative to his body. A person who measures the ball's velocity at the instant of release will find that the ball's velocity relative to the ground at that instant is
- a. 2.0 m/s, up.
  - b. 3.0 m/s, down.
  - c. 3.0 m/s, up.
  - d. 5.0 m/s, down.
  - e. 12.8 m/s, down.

Answer: b

6. Starting from rest, a car travels 1,350 meters in 1.00 minute. It accelerated at  $1.0 \text{ m/s}^2$  until it reached its cruising speed. Then it drove the remaining distance at constant velocity. What was its cruising speed?

Answer: 30 m/s

7. Wiley Coyote has missed the elusive roadrunner once again. This time, he leaves the edge of the cliff at 50 m/s horizontal velocity. If the canyon is 100 m deep, how far from the edge of the cliff does the coyote land?

Answer: 226m

8. Problem 4.30 at the end of chapter 4 in the textbook.