

This print-out should have 8 questions. Multiple-choice questions may continue on the next column or page – find all choices before answering.

Tipler PSE5 03 58

001 (part 1 of 3) 10.0 points

A particle moves in the xy plane with constant acceleration. At time zero, the particle is at $x = 4.5$ m, $y = 6.5$ m, and has velocity $\vec{v}_o = (6.5 \text{ m/s}) \hat{i} + (-2.5 \text{ m/s}) \hat{j}$. The acceleration is given by $\vec{a} = (6.5 \text{ m/s}^2) \hat{i} + (1 \text{ m/s}^2) \hat{j}$.

What is the x component of velocity after 9 s?

Correct answer: 65 m/s.

002 (part 2 of 3) 10.0 points

What is the y component of velocity after 9 s?

Correct answer: 6.5 m/s.

003 (part 3 of 3) 10.0 points

What is the magnitude of the displacement from the origin ($x = 0$ m, $y = 0$ m) after 9 s?

Correct answer: 327.169 m.

Dropping Medical Supplies

004 10.0 points

A plane drops a hamper of medical supplies from a height of 5210 m during a practice run over the ocean. The plane's horizontal velocity was 133 m/s at the instant the hamper was dropped.

The acceleration of gravity is 9.8 m/s^2 .

What is the magnitude of the overall velocity of the hamper at the instant it strikes the surface of the ocean?

Correct answer: 346.129 m/s.

Serway CP 03 32

005 10.0 points

A fireman, 45.1 m away from a burning building, directs a stream jet of water from a ground level fire hose at an angle of 34.1° above the horizontal.

The acceleration of gravity is 9.8 m/s^2 .

If the speed of the stream as it leaves the hose is 58.8 m/s, at what height will the stream of water strike the building?

Correct answer: 26.3309 m.

Serway CP 03 49

006 (part 1 of 3) 10.0 points

A rocket is launched at an angle of 42° above the horizontal with an initial speed of 76 m/s. It moves for 9 s along its initial line of motion with an acceleration of 29 m/s^2 . At this time its engines fail and the rocket proceeds to move as a projectile.

The acceleration of gravity is 9.8 m/s^2 .

Find the maximum altitude reached by the rocket.

Correct answer: 3837.91 m.

007 (part 2 of 3) 10.0 points

What is its total time of flight?

Correct answer: 59.9965 s.

008 (part 3 of 3) 10.0 points

What is its horizontal range?

Correct answer: 14152.7 m.