Week 3 Problem Set (5303998)

Question 1 2 3 4 5 6 7 8 9 10 11 12

1. Question Details OSColPhys1 2.P.023.WA. [2707309]

An aircraft, traveling northward, lands on a runway with a speed of 65 m/s. Once it touches down, it slows to 5.9 m/s over 720 m of runway. What is the average acceleration (magnitude and direction) of the plane during landing? Take the positive direction to be northward. (Indicate the direction with the sign of your answer.)

[ ] -2.91 m/s^2

Supporting Materials

Physical Constants

2. Question Details OSColPhys1 2.P.025.WA. [2707268]

A particular airplane will reach liftoff at a speed of 120 km/h.

(a) What minimum constant acceleration does the airplane require for it to liftoff after a takeoff run of 260 m? (Enter the magnitude only.)

[ ] 2.14 m/s^2

(b) How long does it take the airplane to reach liftoff speed?

[ ] 15.6 s

Supporting Materials

Physical Constants

3. Question Details OSColPhys1 2.P.026.WA. [2707246]

A particle undergoes a constant acceleration of 3.80 m/s^2. After a certain amount of time, its velocity is 13.2 m/s. (Where applicable, indicate the direction with the sign of your answer.)

(a) If its initial velocity is 6.6 m/s, what is its displacement during this time?

[ ] 17.2 m

(b) What distance does it travel during this time?

[ ] 17.2 m

(c) If its initial velocity is −6.6 m/s, what is its displacement during this time?

[ ] 17.2 m

(d) What is the total distance the particle travels during the interval in part (c)?

[ ] 28.7 m

Supporting Materials

Physical Constants

4. Question Details OSColPhys1 2.P.022.WA. [2707362]

A motorcycle is stopped at a traffic light. When the light turns green, the motorcycle accelerates to a speed of 86 km/h over a distance of 47 m.

(a) What was the average acceleration of the motorcycle over this distance?

[ ] 6.07 m/s^2

(b) Assuming the motorcycle maintained a constant acceleration, how far is it from the traffic light after 3.4 s?

[ ] 35.1 m

Supporting Materials

Physical Constants

5. Question Details OSColPhys1 2.P.021.WA. [2707419]

A driver in a car, originally moving at 10.6 m/s, applies the brakes until the car comes to a stop. The car moves a distance of 35.6 m while braking. How much time did it take for the car to stop? Assume constant acceleration during braking.

[ ] 6.72 s

Supporting Materials

Physical Constants

6. Question Details OSColPhys1 2.P.024.WA. [2707302]

A driver in a moving car applies the brakes. The car slows to a final speed of 3.45 m/s over a distance of 40.0 m and a time interval of 7.05 s. The acceleration while braking is approximately constant.

(a) What is the car's original speed before braking?

[ ] 7.9 m/s

(b) What is its acceleration during this time? (The car's initial velocity is in the positive direction. Indicate the direction with the sign of your answer.)

[ ] -0.631 m/s^2

Supporting Materials

Physical Constants

7. Question Details OSColPhys1 2.P.031.WA. [2707411]

From the top of a cliff, a person throws a stone straight downward. The initial speed of the stone just after leaving the person's hand is 9.8 m/s.

(a) What is the acceleration (magnitude and direction) of the stone while it moves downward, after leaving the person's hand?

magnitude [ ] 9.8 m/s^2

direction ---Select--- downward

Is the stone's speed increasing or decreasing?

- increasing
- decreasing

(b) After 0.53 s, how far beneath the top of the cliff is the stone? (Give just the distance fallen, that is, a magnitude.)

[ ] 6.57 m

Supporting Materials

Physical Constants

8. Question Details OSColPhys1 2.P.030.WA. [2707339]

You toss a racquetball directly upward and then catch it at the same height you released it 1.50 s later. Assume air resistance is negligible.

(a) What is the acceleration of the ball while it is moving upward?

magnitude [ ] 9.8 m/s^2

direction ---Select--- downward

(b) What is the acceleration of the ball while it is moving downward?

magnitude [ ] 9.8 m/s^2

direction ---Select--- downward

(c) What is the acceleration of the ball while it is at its maximum height?

magnitude [ ] 9.8 m/s^2

direction ---Select--- downward

(d) What is the velocity of the ball when it reaches its maximum height?

magnitude [ ] 0 m/s

direction ---Select--- The magnitude is zero.

(e) What is the initial velocity of the ball?

magnitude [ ] 7.35 m/s

direction ---Select--- upward

(f) What is the maximum height that the ball reaches?

[ ] 2.76 m

Supporting Materials

Physical Constants

9. Question Details OSColPhys1 2.P.032.WA. [2707375]

A cannon fires a shell straight upward; 2.1 s after it is launched, the shell is moving upward with a speed of 17 m/s. Assuming air resistance is negligible, find the speed (magnitude of velocity) of the shell at launch and 4.6 s after the launch.

(a) at launch

[ ] 37.6 m/s

(b) 4.6 s after the launch

[ ] 7.5 m/s

Supporting Materials

Physical Constants

10. Question Details OSColPhys1 2.P.033.WA. [2707265]

You launch a model rocket from ground level. It moves directly upward with a constant acceleration of 81.0 m/s^2 for 1.50 seconds, at which point it runs out of fuel. Assuming air resistance on the rocket is negligible, what is the maximum altitude (above the ground) achieved by the rocket?

[ ] 844 m

Supporting Materials

Physical Constants

11. Question Details OSColPhys1 2.P.037.WA. [2707278]

You throw a softball straight upward with an initial speed of 5.5 m/s. Assume air resistance is negligible.

(a) How long does it take for the softball to return to your hand (assuming your hand stays in the same position)?

[ ] 1.12 s

(b) How long does it take for the softball to reach its maximum height?

[ ] 0.561 s

Supporting Materials

Physical Constants

12. Question Details OSColPhys1 2.P.038.Tutorial.WA. [2707291]

Jack drops a stone from rest off of the top of a bridge that is 22.2 m above the ground. After the stone falls 6.4 m, Jill throws a second stone straight down. Both rocks hit the water at the exact same time. What was the initial velocity of Jill's rock? Assume upward is the positive direction and downward is negative. (Indicate the direction with the sign of your answer.)

[ ] -17.7 m/s

Supporting Materials

Physical Constants

Assignment Details