

Module 2

Physics

Assignment #1

Read pages 37 - 49.

Write the answers on your own paper, not on this sheet.

1. The three equations used in this module will only work if what value is constant?
2. A boat speeds by at constant velocity 28 meters per second. How far will the boat travel in 1.0 minute?
3. A car is traveling 42 meters per second when it brakes for 2.5 seconds. If the acceleration of the brakes is -1.5 m/s^2 , what is the final velocity of the car?
4. A drag racer starts from rest and accelerates at a rate of 31.7 m/s^2 . How long will it take the car to travel the length of the drag strip, 405 meters?
5. Alek was driving down the road one night at 25 meters per second when he saw a huge buck standing in the middle of the road. He slammed on the brakes, which have a maximum deceleration of 3.1 m/s^2 . How far did his car travel before he stopped?
6. Grace was riding a horse at 3.2 m/s. The horse heard a coyote and accelerated at a rate of 1.4 m/s^2 for 15 seconds. How far did her horse run during that time?
7. Daniel was dropping golf balls off the top of the Wursthall building. If the building is 12.3 meters tall, how long will it take a golf ball to hit the ground?
8. Honors - A Lamborghini Huracan Evo can go from 0.0 to 60.0 mph in 2.5 seconds. What's its acceleration in feet per second²?
9. Honors – How far does the Lambo in the previous problem travel while it's accelerating?
10. Honors – A bird is flying at 5.4 meters per second. It accelerates at $0.70 \text{ meters per second}^2$ and travels 33 meters. For how many seconds did the bird accelerate?

Questions to Ask:

What is the starting velocity?

What is the final velocity?

Did they give you a distance?

Did they give you a time?

What's the acceleration? If it's free falling, it's -9.81 m/s^2 .

Module 2

Assignment #2

Physics

Read pages 50 - 62.

11. If an object is thrown up into the air, when is its velocity zero? What is its acceleration at this moment?
12. What is the definition of free fall?
13. What is air resistance? How does it affect the acceleration of a freely falling object?
14. A feather and a brick are placed in a long tube, then all the air is sucked out of the tube. While they are in the tube, which will occur? (Choose one.)
 - a. The feather will fall faster because it is lighter.
 - b. The brick will fall faster because it is heavier.
 - c. They will both fall at the same rate because there is no air.
 - d. It is not possible to answer this because we don't know the mass of the feather or brick.
15. You have two balls that have the same mass. Ball A is 1.2 inches in diameter and Ball B is 3.8 inch in diameter. Which ball will have the fastest terminal velocity?
16. You throw a ball up in the air with a starting velocity of 21 m/s. What is the maximum height that the ball reaches?
17. You drop a rock down a water well and hear a splash after 12 seconds. How deep is the well?
18. Callum drops a golf ball off a 90.0-meter tall building.
 - a. How far will it fall in 4 seconds?
 - b. How long does it take to hit the ground?
19. Honors - You stand on the balcony of a hotel (22 feet above the ground) and throw your friend's sneaker up into the air. The sneaker takes 1.9 seconds to hit the ground. What was the sneaker's starting velocity?
20. Honors – Merrick throws his keys upward to Lacen who is in a window 4.6 meters above him. Lacen catches the keys 1.8 seconds later.
 - a. With what velocity did Merrick throw the keys?
 - b. What was the velocity of the keys just before Lacen caught them?

