

1 Motion

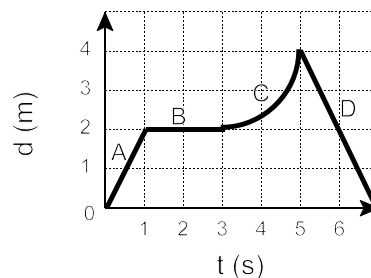
Quiz Practice Problems

Name _____

AP Physics B

1. A fly takes off with an acceleration of 0.700 m/s^2 from a wall. How many seconds will it take the fly to reach a speed of 12.6 km/h ?

2. In the graph:
- What is the speed and acceleration from 0 to 1 seconds?
 - What is the speed and acceleration from 1 to 3 seconds?
 - What is the acceleration from 3 to 5 seconds? (assume it is constant)
 - What is the object doing from 5 to 7 seconds?



3. The evil Victor Vector has tied poor Velma Velocity to a train track. He is aboard a train which is moving at 5.00 m/s when it is 175 m from the struggling Velma. If the train is accelerating at 3.00 m/s^2 , how much time does she have to make her escape?

4. The Hanson brothers are backstage after a concert, sauntering at 0.500 m/s , when a horde of screaming fans gives chase. The musicians are 12.0 m away from the safety of their dressing room. If they accelerate steadily and reach the room in 3.20 s , how fast are they traveling as they pass its doorway?

5. Mr. M is a human cannonball in his spare time. If the cannon he uses is 1.75 meters long and he exits the cannon at a speed of 20.0 m/s , what acceleration does the cannon impart to Mr. M?

Answers:
1) 5.00 s
2) a. 2 m/s ; 0 m/s^2
b. 0 m/s ; 0 m/s^2
c. 1 m/s^2 (use $a=2d/t^2$ since $v_f=0$)
d. moving backward at a constant speed
3) 9.26 s
4) 7.00 m/s
5) 114 m/s^2

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Additional Quiz Practice Problems

Name _____ AP Physics B

1. A few years ago, the legal speed limit on the Turner Turnpike was changed from 55.0 mi/h to 75.0 mi/h. How much time (in hours) was saved on the 86.0 mile trip from the Tulsa entrance to the Oklahoma City exit for someone traveling at the legal speed limit?
2. In an emergency, a driver brings a car to a full stop in 5.00 seconds. The car is traveling along a highway at a rate of 24.6 m/s when braking begins.
 - a. At what rate is the car accelerated?
 - b. How far does it travel before stopping?
3. If a bullet has an average speed of 300. m/s as it travels within the 0.800 m long barrel of a rifle, at what rate is the bullet accelerated while in the barrel?
4. An engineer is to design a runway to accommodate airplanes that must gain a ground speed of 360. km/h (approx. 225 mi/h) before they can take off. These planes are capable of being accelerated uniformly at the rate of $3.60 \times 10^4 \text{ km/h}^2$.
 - a. How many kilometers long must the runway be?
 - b. How many seconds will a plane need to accelerate to take-off speed?

Answers:
1) 0.417 h
2) a. -4.92 m/s^2
b. 61.5 m
3) 225,000 m/s^2
4) a. 1.80 km
b. 36.0 s