

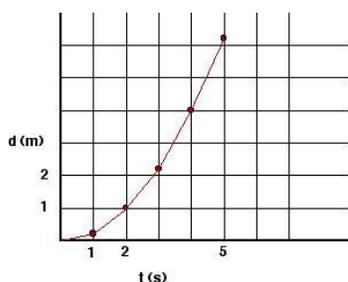
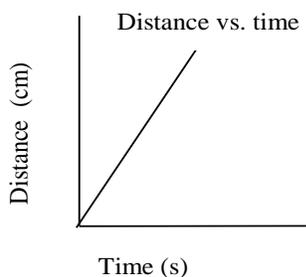
Vocabulary

- Extrapolation
- Interpolation
- Precision
- Accuracy
- Milli-
- Centi-
- Kilo-
- Scalar
- Vector
- Distance
- Displacement
- Manipulated (Independent) variable
- Responding (Dependent) variable
- Acceleration
- Speed
- Velocity
- Component vector
- Resultant vector
- Projectile
- Trajectory
- Air resistance
- Acceleration due to gravity

Graphing

For each of the following graphs:

- the shape of the graph
- identify the relationship between the variables
- the equation



Shape _____
 Relationship _____
 Equation _____

The slope of a position-time graph gives the **average** _____ of the object.
The slope of a velocity-time graph gives the **average** _____ of the object.

Process Skills

170 cm = _____ m. 1500 km = _____ m. 1.2 m = _____ mm.

How many significant digits does each of the following measurements contain?

1700 g _____ 1.70 g _____ 0.017 g _____ 0.0170 g _____

What is 165,000 m/s written in correct scientific notation? _____

To convert 60 km/hr to m/s, you would multiply by _____ and divide by _____.

Projectiles

- A pendulum's period depends only on the acceleration due to gravity and the _____ of the pendulum.
- All projectiles accelerate at a rate of _____ in a _____ direction.
- At the top of the flight, the velocity is _____.
- How does the final velocity of a vertical projectile compare to the initial velocity?
- In the absence of air resistance, the _____ component of a projectile's velocity **does not** change as the projectile moves.
- In the absence of air resistance, the _____ component of a projectile's velocity **does** change as the projectile moves.
- At the instant a ball is thrown horizontally, an identical ball is dropped from the same height. Which has the greater vertical acceleration? Which hits the ground first?
- A ball thrown into the air will never go as far as physics predicts because of _____.
- At what angle will a thrown ball go farthest?
- At what angle will a thrown ball go highest?
- At what part of a trajectory does a projectile have minimum speed?

Problems

A student runs around a track (400 meters) and ends at the same point from which he started in 85 seconds.

- What is his displacement?
- What distance did he run?
- What is his speed?
- What is his velocity?
- If he runs in a straight path at the same speed for 120 seconds, what is his displacement?

A car accelerates from rest at a rate of 5 m/s^2 for a period of 8 seconds. At the 10 second mark, the car slams on its brakes. This braking produces an acceleration of -8.0 m/s^2 . The car brakes uniformly until it comes to a complete rest.

- What is the distance the car has traveled at the 10 second mark?
- What is the total time the car was in motion?
- What is the total distance traveled by the car?

A student drops a rock from a cliff that is 100.0 meters high.

- How many seconds does it take the rock to hit the ground below?
- How far will the rock fall in 2.0 seconds?
- What is its velocity immediately before it hits the ground?

A bullet is shot straight up and returns to its starting point in 5.0 seconds.

- What is its velocity at the top of its flight?
- What was its initial velocity?
- How high did it go?

An arrow is shot horizontally from a tower that is 15 m high. The arrow had an initial velocity of 25 m/s.

- How far will the arrow be from the tower 2 seconds later?
- How long will it take the arrow to hit the ground?
- How far from the tower will the arrow land?
- If the arrow had been shot at twice the speed, how long would it take to hit the ground?

A boat has a speed of 5.0 m/s relative to the river. The river has a velocity of 2.0 m/s east relative to the shore.

- What is the velocity of the boat relative to the shore if it moves downstream with the river?
- What is the velocity of the boat relative to the shore if it moves upstream with the river?
- What is the velocity of the boat relative to the shore if it moves directly across the river?

Draw a position vs time, a velocity vs time, and an acceleration vs time graph for each of the following situations:

- A ball is thrown up into the air and returns to your hand.
- A ball is dropped, hits the ground, and returns to your hand.
- A ball is carried by a person walking at a constant speed.

