Tutorial 1

Cutnell & Johnson Problem 1.41

The displacement vector $\vec{A}$ has a scalar component of A_x = 80.0 m and A_y = 60.0 m. The displacement vector $\vec{B}$ has a scalar component of B_x = 60.0 m and the magnitude of B = 75.0 m. The displacement vector $\vec{C}$ has a magnitude of 100.0 m and is directed at an angle of 36.9° above the +x axis. Two of these vectors are equal. Determine which two, and support your choice with calculation.

Tutorial 1

Cutnell & Johnson Problem 2.9

A tourist being chased by an angry bear is running in a straight line toward his car at a speed of 4.0 m/s. The car is a distance *d* away. The bear is 26 m behind the tourist and running at 6.0 m/s. The tourist reaches the car safely. What is the maximum possible value for *d*?.

Tutorial 1

Cutnell & Johnson Problem 2.78

In 1998, NASA launched *Deep Space 1* (DS-1), a spacecraft that successfully flew by the asteroid named 1992 KD (which orbits the sun millions of miles from the earth). The propulsion system of DS-1 worked by ejecting high-speed argon ions out the rear of the engine. The engine slowly increased the velocity of DS-1 by about 9.0 m/s per day. **(a)** How much time (in days) would it take to increase the velocity of DS-1 by 2700 m/s? **(b)** What was the acceleration of DS-1 (in m/s^2)?

Tutorial 1

Cutnell & Johnson Problem 2.25

A jogger accelerates from rest to 3.0 m/s in 2.0 s. A car accelerates from 38.0 to 41.0 m/s also in 2.0 s. **(a)** Find the acceleration (magnitude only) of the jogger. **(b)** Determine the acceleration (magnitude only) of the car. **(c)** Does the car travel farther than the jogger during the 2.0 s? If so, how much farther?

Tutorial 1

Cutnell & Johnson Problem 2.63

While standing on a bridge 15.0 m above the ground, you drop a stone from rest. When the stone has fallen 3.20 m, you throw a second stone straight down. What initial velocity must you give the second stone if they are both to reach the ground at the same instant? Take the downward direction to be the negative direction.

Vector Addition Example

- **Most general case: the two vectors to be added point in arbitrary directions.**

  Two donkeys are pulling a cart. One is exerting a force of 25 N in a direction 20° N of W, the other is exerting a force of 10 N in a direction 30° S of W. What is the magnitude and direction of the net force?