1. Is the direction of the net force always the same as the direction of the velocity for an object? Explain your answer.

It can be but not always, the net force could be including gravity and therefore the velocity of a projectile is not the same as the net force of the object.

1. A model rocket engine exerts a force of 124 N on a model rocket whose mass is 73.2 g. What is the acceleration of the rocket?

1.69(m/s^2)

1. One consequence of wind resistance is that falling objects eventually reach a speed where the wind resistance upward is exactly equal to the downward weight. The speed at which this happens is called the terminal velocity. For an object in free-fall, that is no forces except wind resistance and gravity act on the object, derive a formula for calculating the terminal velocity.

mg = cv (c is coefficient of wind)

1. For the forces shown below, determine the acceleration vector if the box has a mass of 25 kg, and the coefficient of friction is 0.2.