THINK AND EXPLAIN:

1- Since the speed of the car is fixed, the car is in dynamic equilibrium and not accelerating which means that the net force on the car is zero.

3- This can be done by exerting equal forces on both boxes and observing the resulting acceleration. The box with higher acceleration has lower mass which is the one filled with feathers while the box with lower acceleration has higher mass which is the one filled with sand.

7- When the apple is at rest above the hand it is affected by two equal and opposite forces (weight and support force) which means that the net force on it is zero. When I release the apple it is affected only by its weigh and the net force on it is 1 N.

8- On the middle hill is the speed increasing and the acceleration is decreasing because of the decrease in the slope of the path.

10- Since the speed of the bear is constant, the net force on it is zero.The force of friction must be 4000 N (the weight of the bear) in the upward direction.

THINK AND SOLVE:

2- Mass = 82 kg, Weight = 820 N

3- $\text{acceleration} = \frac{\text{net force}}{\text{mass}} = \frac{200\ N}{40\ kg} = 5 m/s^2$

4- $\text{acceleration} = \frac{\text{net force}}{\text{mass}} = \frac{1 N}{1\ kg} = 1 m/s^2$

$\text{acceleration} = \frac{\text{net force}}{\text{mass}} = \frac{2 N}{2\ kg} = 1 m/s^2$

5-

$\text{total thrust} = 4 \times 30000 = 120000 N$

$\text{acceleration} = \frac{\text{net force}}{\text{mass}} = \frac{120000 N}{30000\ kg} = 4 m/s^2$

6- $\text{acceleration} = \frac{\text{final velocity-initial velocity}}{\text{time}} = \frac{0-9}{0.2} = -45 m/s^2 = decelaration of\ 45 m/s^2$

$Force = mass \times acceleration = 100 \times 45 = 4500 N$