THINK AND EXPLAIN:

2- Since the race-car driver is rounding a curve, he is changing direction which means that his velocity is changing and cannot be constant. He was supposed to say: "the race car driver rounded the curve at a **constant speed** of 1200 km/h".

5- The bear's enormous mass means large inertia compared to your small mass and inertia, this makes it more difficult for the bear to move in zigzag pattern and change direction as fast as you which gives you the advantage.

7- Although the force of the rocket is needed to carry the space probe into outer space, once moving there, no force is needed to keep it moving. Since there is no friction or any other force acting on the space probe in outer space, it will move by its own inertia.

10- No, this does not violate Newton's law of inertia. The shopping cart stops as a result of friction while Newton's law of inertia describes only the situations when there is no net force acting on the object.

18- The 100,000 km/h speed represents the speed of Earth relative to the Sun, while the speed of Earth relative to us is zero since we are moving with Earth at the same speed, this is why we aren't swept off.

THINK AND SOLVE:

1-

$$\text{average speed} = \frac{\text{distance}}{\text{time}} = \frac{24\,m}{0.5\,s} = 48\,\frac{m}{s}$$

2-

$$\text{average speed} = \frac{\text{distance}}{\text{time}} = \frac{50\,m}{10\,s} = 5\,\frac{m}{s}$$

$$1\,\text{minute} = 60\ \text{seconds}$$

$$\text{distance traveled} = \text{speed} \times \text{time} = 5 \times 60 = 300\,m$$

3-

(a) When both forces act in the same direction:

Net force = 30 + 20 = 50 N

(b) When both forces act in opposite directions:

Net force = 30 - 20 = 10 N

4-

(a) Since the crate is moving at constant speed, the net force acting on it is zero.

(b) The force of friction acting on the crate in this case equals the applied force in magnitude, 100 N, and opposite in direction.

5- The scale readings should be 400 N and 200 N.