

Answers to selected questions

Chapter 7

Q6. a. Yes. The direction of the momentum has changed.

b. Yes. A strong force acts for the brief time that the ball is in contact with the wall producing the impulse needed to change the momentum.

Q12. The truck will require the larger impulse because its greater mass involves a larger momentum than that of the bicycle traveling at the same velocity. The truck then experiences a larger change in momentum to bring it to a stop and thus a larger impulse is needed.

Q18. Yes. If the lighter defensive back is traveling with a large enough velocity, his momentum may exceed that of the fullback. The momentum of the system after the collision would then be in the direction of the initial velocity of the defensive back.

Q24. The velocity of the system after the collision will be less than that of the first railroad car before the cars couple in order for momentum to be conserved. The larger mass of the two cars together requires a smaller velocity to produce the same momentum as that of the first car before the collision.