

Momentum Study Guide
(with answers)

Part 1: pp. 870-871: #1-9

Answers:

1. 10.0 kg*m/s
2. 45 N
3. 2.07 m/s
4. 0.26 m/s, North
5. 650 m/s
6. 0.38 m/s in the same direction as ball A's initial velocity
7. 1.3 m/s, west
8. -0.44 m/s
9. -86 m/s

Part 2: pp. 250-254: #32, 41, 56, 57, 58, 60, 62, 66, 67, 70, 90

Answers:

41. a. An external force (gravity) is acting on it.
b. Total momentum would be conserved if the system includes the ball plus the Earth. (The gain in momentum of the ball while falling through the air is equal to the momentum lost by the earth. Of course, since the Earth is so massive compared to the ball, the change in momentum of the Earth is very difficult to detect.)
56. 0.013 s
57. a. -14 kg*m/s
b. -32000 N
58. 74 kg*km/s; 1.0×10^1 m/s
60. -1200 N
62. 4.8 N*s
66. 25 m/s
67. a. -5.1 kg*m/s
b. -1.0×10^2 N
c. -1.0×10^1 N
70. 1300 s (or 22 min)
90. a. no answer given. Just make sure you have two separate sketches—"before"
AND "after"
b. 0.041 m/s
c. Yes. The velocity is positive, so the football crosses the goal line for a touchdown.