



# McRoberts Secondary

Momentum Retest 2025-12-04



## Personal Data

Family Name:
Given Name:
Signature:
checked

## Registration Number

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1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1
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4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4
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7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7
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9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9

In this section **no** changes or modifications must be made!

Scrambling

0 0

Type

020

Exam ID(Physics 12)

25120400002

Please mark the boxes carefully: ☒ Not marked: ☐ or ☐

This document is scanned automatically. Please keep clean and do not bend or fold. For filling in the document please use a **blue or black pen**.

**Only clearly marked and positionally accurate crosses will be processed!**

## Answers 1 - 15

	a	b	c	d
1	<input type="checkbox"/>	<input type="checkbox"/>		
2	<input type="checkbox"/>	<input type="checkbox"/>		
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8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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## Answers 16 - 20

	a	b	c	d
16	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

a b c d

a b c d





1. True or false? Momentum is conserved in a completely inelastic collision.
  - a. True
  - b. False
2. True or false? Momentum is conserved when two objects collide and stick together.
  - a. True
  - b. False
3. True or false? Kinetic energy is conserved when two objects collide and stick together.
  - a. True
  - b. False
4. True or false? Kinetic energy is conserved in all collisions.
  - a. True
  - b. False
5. A rubber ball and a lump of putty have equal mass. They are both thrown with equal speed at a wall. The rubber ball bounces back with nearly the same speed with which it hit the wall. The putty sticks to the wall. Which object experiences the greater momentum change?
  - a. The ball.
  - b. The putty.
  - c. Both experience the same momentum change.
  - d. Cannot be determined from the information given.
6. A light rubber ball moving at high speed strikes a heavy stationary cart. As a result of the collision, the rubber ball rebounds and the cart rolls forward. Which object experienced the greater magnitude of impulse?
  - a. The rubber ball.
  - b. The cart.
  - c. Both experienced the same magnitude of impulse.
  - d. It depends on whether the collision was elastic or inelastic.
7. A ball moving due east at 24 m/s collides with a wall. As a result, the ball moves due west at 24 m/s. Which of the following best describes the collision?
  - a. Elastic.
  - b. Inelastic.
  - c. Completely inelastic.
  - d. Any of the above, depending on the mass of the ball.
8. Impulse is the area under a graph of
  - a. force vs. time
  - b. velocity vs. time
  - c. force vs. displacement
  - d. momentum vs. time
9. A very light ball rolling with speed  $v$  collides with a very heavy ball at rest. If the collision is elastic, then the light ball's speed after the collision is approximately
  - a. 0
  - b.  $v/2$
  - c.  $v$
  - d.  $2v$

10. A very heavy ball rolling with speed  $v$  collides with a very light ball at rest. If the collision is elastic, then the light ball's speed after the collision is approximately
- $v/2$
  - $v$
  - $2v$
  - $3v$
11. A very heavy ball rolling with speed  $v$  collides with a very light ball at rest. If the collision is completely inelastic, then the speed of the combined mass after the collision is approximately
- 0
  - $v/2$
  - $v$
  - $2v$
12. Two balls of equal mass roll straight toward each other with the same speed  $v$  and collide head on. If the collision is completely inelastic, then the speed of the combined mass after the collision is
- 0
  - $v/2$
  - $v$
  - $2v$
13. A ball of mass 132 g, moving horizontally with speed 25 m/s strikes a wall and rebounds at 16.0 m/s. What is the magnitude of the change in momentum of the ball?
- 1900 kg m/s
  - 1.2 kg m/s
  - 5.4 kg m/s
  - 2100 kg m/s
14. A ball of mass  $m$  rolls with speed  $v$  towards another ball of mass  $9m$  at rest. If the collision is completely inelastic, what is the speed of the combined mass after the collision?
- $v/9$
  - $v/10$
  - $9v$
  - $v/81$
15. A 191 g baseball is thrown towards a batter at 30.0 m/s. The batter hits the ball back along the same path, and at the same speed. If the bat was in contact with the ball for 1.80 ms, the average force exerted by the bat was
- 3180 N
  - $1.82 \times 10^6$  N
  - 6370 N
  - 6.37 N
16. The momentum of a male Olympic sprinter in the middle of a 100 m dash is about
- $10^1$  kg m/s
  - $10^2$  kg m/s
  - $10^3$  kg m/s
  - $10^4$  kg m/s

17. A 2.4 kg object moving due north at 23 m/s collides with a barrier for 0.91 s, resulting in a final velocity of 10 m/s due east. What is the magnitude of impulse on the object?
- a. 67 N s
  - b. 74 N s
  - c. 60 N s
  - d. 83 N s
18. A car of mass 1485 kg, traveling with a velocity 35 km/h, strikes a parked truck of mass 8910 kg head-on. The bumpers lock together in this completely inelastic collision. What fraction of the initial kinetic energy is lost in the collision?
- a. 6/7
  - b. 1/6
  - c. 1/7
  - d. 1/36
19. A skater of mass 97 kg skates at speed 17.0 m/s towards another skater of mass 91 kg who is standing still with open arms. If the skaters hold on to each other after they collide, with what speed do they both move off together?
- a. 8.8 m/s
  - b. 6.6 m/s
  - c. 4.5 m/s
  - d. 5.7 m/s
20. A bullet (69 g) is fired into the wooden block (7.00 kg) of a ballistic pendulum. As a result, the bullet is lodged into the block, and the centre of mass of the pendulum-projectile system swings up to a maximum height of 20 cm. What was the initial speed of the bullet?
- a. 232 m/s
  - b. 302 m/s
  - c. 395 m/s
  - d. 203 m/s