



McRoberts Secondary



Momentum Test 2025-10-27

Personal Data

Family Name:	
Given Name:	
Signature:	
	checked

Registration Number

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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)

25102700003

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"/>		
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9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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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	a	b	c	d

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



1. True or false? Kinetic energy is conserved in all collisions.
 - a. True
 - b. False
2. True or false? Momentum is conserved in both elastic and inelastic collisions.
 - 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? Momentum is conserved when two objects collide and stick together.
 - a. True
 - b. False
5. In a game of pool, the white cue ball hits the #2 ball and stops, while the #2 ball moves away with the same velocity as the cue ball had originally. Both balls have the same mass. The type of collision is
 - a. elastic
 - b. inelastic
 - c. completely inelastic
 - d. any of the above, depending on the mass of the balls
6. A very light object moving to the right collides with a very heavy object at rest. After the collision, the heavy object moves to the right with a small speed, and the light object moves to the left. Which object experienced the greater magnitude of impulse during the collision?
 - a. The heavy object.
 - b. The light object.
 - c. Both objects experienced the same magnitude of impulse.
 - d. Cannot be determined from the information given.
7. Two equal mass balls, one red and one blue, are dropped from the same height, and bounce off the floor. The red ball bounces higher than the blue ball. Which ball is subjected to the greater magnitude of impulse during its collision with the floor?
 - a. The red ball.
 - b. It depends on the elasticity of the collisions.
 - c. Both balls were subjected to the same impulse.
 - d. The blue ball.
8. An object of mass m is moving with momentum p . Which of the following represents its kinetic energy?
 - a. $p^2/(2m)$
 - b. $mp^2/2$
 - c. mp
 - d. $mp/2$

9. 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
 - $2v$
10. Two objects collide and stick together. Kinetic energy is
- definitely conserved.
 - conserved only if the collision is elastic.
 - conserved only if there is no friction.
 - definitely not conserved.
11. Two objects collide and stick together. Linear momentum is
- definitely not conserved.
 - definitely conserved.
 - conserved only if the collision is elastic.
 - conserved only if there is no friction.
12. A very light ball rolling with speed v collides with a very heavy 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
 - $2v$
13. A ball of mass m rolls with speed v towards another ball of mass $(2/1)m$ at rest. If the collision is completely inelastic, what is the speed of the combined mass after the collision?
- $(2/1)v$
 - $(1/2)v$
 - $(2/3)v$
 - $(1/3)v$
14. A ball of mass 99 g is dropped from a height of 4 m. Its momentum just before it strikes the ground is
- 880 kg m/s
 - 400 kg m/s
 - 870 kg m/s
 - 0.88 kg m/s
15. A fire hose is turned on the door of a burning building in order to knock it down. This requires a force of 1052 N. If the hose delivers 33 kg / s, what is the velocity of water needed, assuming that the water doesn't bounce back?
- 40 m/s
 - 17 m/s
 - 32 m/s
 - 56 m/s

16. A machine gun, of mass 12 kg, fires bullets of mass 38 g, with a muzzle speed of 1130 m/s, at the rate of 978 rounds per minute. What is the average force exerted on the machine gun mount?
- 700000 N
 - 576000 N
 - 42000 N
 - 700 N
17. Object 1 and Object 2 have the same momentum. The ratio of Object 1's mass to Object 2's mass is $m_1/m_2 = 3/4$. What is the ratio of Object 1's kinetic energy to Object 2's kinetic energy, KE_1/KE_2 ?
- 16/9
 - 9/16
 - 4/3
 - 3/4
18. A bullet (16 g) is fired into the wooden block (8.00 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 62 cm. What was the initial speed of the bullet?
- 1750 m/s
 - 3390 m/s
 - 2450 m/s
 - 2800 m/s
19. A car of mass 1353 kg, traveling with a velocity 71 km/h, strikes a parked truck of mass 4059 kg head-on. The bumpers lock together in this completely inelastic collision. What fraction of the initial kinetic energy is lost in the collision?
- 1/4
 - 1/9
 - 3/4
 - 1/3
20. A skater of mass 32 kg skates at speed 19 m/s towards another skater of mass 90 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?
- 6.49 m/s
 - 4.46 m/s
 - 2.55 m/s
 - 4.98 m/s