



McRoberts Secondary

Dynamics Unit Test 2025-11-12



Personal Data

Family Name:
Given Name:
Signature:
checked

Registration Number

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

Scrambling

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Type

020

Exam ID(Physics 11)

25111200006

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
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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

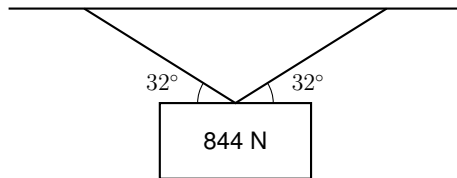
a b c d



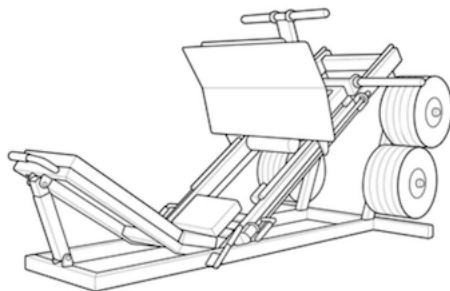
1. True or false? If an object is at rest, then the net force on the object must be zero.
 - a. True
 - b. False
2. True or false? The mass of an object on the moon is the same as its mass on earth.
 - a. True
 - b. False
3. True or false? If an object is moving to the left, then the net force on it must point to the left.
 - a. True
 - b. False
4. A box that weighs 100 N rests on a digital scale on the floor of an elevator. When would the scale measure a weight less than 100 N? *Select all that apply.*
 - a. moving upward with increasing speed.
 - b. moving upward with decreasing speed.
 - c. moving downward with increasing speed.
 - d. moving downward with decreasing speed.
5. In a rugby game, Bob (mass = 73 kg) tackles Joe (mass = 94 kg) and knocks Joe to the ground. During the collision, who applied the greater force on whom?
 - a. Bob applied a greater force on Joe (than Joe did on him).
 - b. Joe applied a greater force on Bob (than Bob did on him).
 - c. Bob and Joe applied the same magnitude force on each other.
 - d. It depends on the relative speeds of Bob and Joe.
6. Why is a greater force needed to start moving a heavy box from rest than to keep pushing it with constant velocity? In the choices below, μ_k is the coefficient of kinetic friction and μ_s is the coefficient of static friction.
 - a. The normal force is greater when the box is at rest.
 - b. $\mu_k < \mu_s$
 - c. $\mu_s < \mu_k$
 - d. The inertia of the box is greater when it is at rest.
7. A physics textbook of mass m is at rest on a flat table. Earth's gravity applies a downward force mg on the book, which we will call the action force. What is the reaction force?
 - a. The book pulling upward on the Earth with force mg .
 - b. The book pushing down on the table with force mg .
 - c. The table pushing up on the book with force mg .
 - d. The table pushing down on the floor with force mg .
8. The gravitational force exerted by a large body, such as the Earth, is called
 - a. gravitational field strength
 - b. gravitational mass
 - c. weight
 - d. inertial mass

9. The mass of an object is 12 kg. What is its weight on Earth?
- 170 N
 - 120 N
 - 12 N
 - 140 N
10. A net force of 41.0 N acts on an object of mass 2.00 kg. What is the acceleration of the object?
- 23.0 m/s²
 - 26.0 m/s²
 - 20.0 m/s²
 - 29.0 m/s²
11. A box slides on the floor in the $+x$ direction. It slows down and comes to a stop with a constant acceleration of -4.01 m/s^2 . The only force acting on the box while it is slowing down is friction between the box and the floor. What is the coefficient of kinetic friction between the box and the floor?
- 0.409
 - 0.594
 - 0.253
 - 0.535
12. As the angle of an inclined plane increases, the parallel force _____ and the perpendicular force _____.
- decreases, decreases
 - decreases, increases
 - increases, decreases
 - increases, increases
13. Adam pulls on a box with 9.0 N of force. Bob pulls on the the same box with 7.0 N of force, at a right angle to Adam's force. What is the magnitude of the net force on the box?
- 11.4 N
 - 16 N
 - 13.6 N
 - 2 N
14. Xavier pulls on a box with 17.0 N of force at 0° . Yuri pulls on the the same box with 21.0 N of force, at 90° . What is the angle of the net force?
- 51.0°
 - 15.4°
 - 82.1°
 - 70.7°
15. Charlie pulls on a box with 27.0 N of force at -171° . Dan pulls on the the same box with 62.0 N of force at 149° . What is the angle of the net force on the box?
- 160.9°
 - 101.1°
 - 175.7°
 - 100.1°

16. A sign that weighs 844 N is supported by two ropes that each makes a 32° angle with the horizontal. The sign is not moving. What is the magnitude of the force exerted by each rope?



- a. 983 N
b. 784 N
c. 747 N
d. 796 N
17. Two forces act on an object. A 31.0-N force acts at 20° . A 79.0-N force acts at 42° . What is the angle of their equilibrant?
- a. -161.0°
b. -149.9°
c. -176.3°
d. -144.2°
18. A box of mass 42 kg slides down a frictionless inclined plane. The angle of incline is 20° from the horizontal. What is the acceleration of the box?
- a. 2.1 m/s^2
b. 2.5 m/s^2
c. 3.9 m/s^2
d. 3.4 m/s^2
19. A box of mass 50 kg slides down an inclined plane with friction. The angle of incline is 70° and $\mu_k = 1.2$. What is the acceleration of the box?
- a. 3.1 m/s^2
b. 1.0 m/s^2
c. 5.2 m/s^2
d. 5.8 m/s^2
20. A leg press machine is inclined at 49.0° from the horizontal. The total mass to be pressed up is 77.0 kg. What force must the legs apply to move the mass at a constant velocity? Assume that friction is negligible.



- a. 622 N
b. 791 N
c. 58 N
d. 570 N