McRoberts Secondary

Dynamics Unit Test 2025-11-12

Personal Data

Family Name:

Given Name:

Signature:

checked

Registration Number

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1	☐	☐	☐	☐	☐	☐	☐	1
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9	☐	☐	☐	☐	☐	☐	☐	9

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

Scrambling 0 0

Type: 020

Exam ID(Physics 11): 25111200004

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

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Only clearly marked and positionally accurate crosses will be processed!

Answers 1 - 15

	a	b	c	d
1	☐	☐		
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12	☐	☐	☐	☐
13	☐	☐	☐	☐
14	☐	☐	☐	☐
15	☐	☐	☐	☐
	a	b	c	d

Answers 16 - 20

	a	b	c	d
16	☐	☐	☐	☐
17	☐	☐	☐	☐
18	☐	☐	☐	☐
19	☐	☐	☐	☐
20	☐	☐	☐	☐
	a	b	c	d

1. True or false? If an object is at rest, then there are no forces acting upon the object.
    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? An object moving at high speed has more inertia than when it is at rest.
    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. A person of mass 55 kg pushes on a wall with 60 N of force. What is the magnitude of the force that the wall exerts on the person?
    a. 60 N
    b. 540 N
    c. 6.1 N
    d. 590 N
6. A rocket moves through outer space with a constant velocity of 9.8 $\mathrm{m/s}$ toward the Andromeda galaxy. What is the net force acting on the rocket?
    a. The net force is zero.
    b. A force equal to its weight on Earth, mg.
    c. Cannot be determined without more information.
    d. A force equal to the gravity acting on it.
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 table pushing down on the floor with force mg.
    b. The table pushing up on the book with force mg.
    c. The book pulling upward on the Earth with force mg.
    d. The book pushing down on the table with force mg.
8. What is the net force on a person who is standing in an elevator moving up with a constant velocity of 3.00 m/s?
    a. 0 N
    b. 3.00 N, up
    c. 3.00 N, down
    d. It depends on the mass of the person.

9. An object weighs 59 N on Earth. What is its mass?

    a. 4.8 kg
    b. 580 kg
    c. 6 kg
    d. 3.8 kg

10. A net force of 968 N acts on an object, and it accelerates at 12 m/s/s in the direction of the net force. What is the mass of the object?

    a. 81 kg
    b. 0.01 kg
    c. 12000 kg
    d. 59 kg

11. A box slides on the floor in the $+\mathrm{x}$ direction. It slows down and comes to a stop with a constant acceleration of $-3.29\,\mathrm{m/s^2}$. 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?

    a. 0.387
    b. 0.336
    c. 0.178
    d. 0.263

12. What force is needed to keep a 42-kg box moving at a constant velocity across a warehouse floor if the coefficient of kinetic friction between the box and the floor is 0.23?

    a. 9.7 N
    b. 39 N
    c. 95 N
    d. 120 N

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?

    a. 16 N
    b. 11.4 N
    c. 5.2 N
    d. 14.7 N

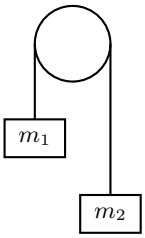
14. Carly pulls on a box with 15.0 N of force. Debby pulls on the the same box at a right angle to Carly. How hard must Debby pull to make the resultant force on the box 17.0 N?

    a. 14.2 N
    b. 8.0 N
    c. 2.0 N
    d. 32.0 N

15. Robert pulls on a box with 84.0 N of force at 348°. Steve pulls on the the same box with 62.0 N of force at 147°. What is the magnitude of the net force on the box?

    a. 47.1 N
    b. 34.3 N
    c. 45.3 N
    d. 40.2 N

16. Two masses are attached to a lightweight cord that passes over a frictionless pulley as shown in the diagram. The values of the masses are $\mathrm{m}_1 = 24.0$ kg and $\mathrm{m}_2 = 80.0$ kg. The hanging masses are free to move. What is the magnitude of the acceleration of the system?



    a. 2.69 m/s/s
    b. 7.23 m/s/s
    c. 5.28 m/s/s
    d. 6.52 m/s/s

17. Two forces act on an object. A 58.0-N force acts at -83°. A 47.0-N force acts at 9°. What is the angle of their equilibrant?

    a. 148.4°
    b. 152.0°
    c. 136.8°
    d. 65.1°

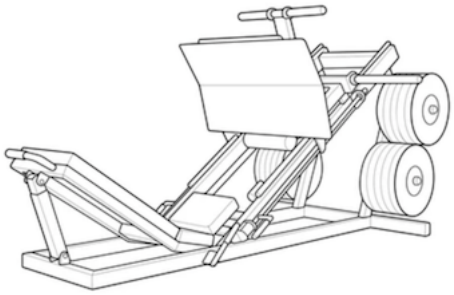
18. A box of mass 68 kg slides down a frictionless inclined plane. The angle of incline is 62° from the horizontal. What is the acceleration of the box?

    a. $8.7\,\mathrm{m/s^2}$
    b. $5.4\,\mathrm{m/s^2}$
    c. $8.3\,\mathrm{m/s^2}$
    d. $5.5\,\mathrm{m/s^2}$

19. A box of mass 71 kg slides down an inclined plane with friction. The angle of incline is 37° and $\mu_\mathrm{k} = 0.61$. What is the acceleration of the box?

    a. $1.8\,\mathrm{m/s^2}$
    b. $1.5\,\mathrm{m/s^2}$
    c. $2.8\,\mathrm{m/s^2}$
    d. $1.1\,\mathrm{m/s^2}$

20. A leg press machine is inclined at 47.0° from the horizontal. The total mass to be pressed up is 119.0 kg. What force must the legs apply to move the mass at a constant velocity? Assume that friction is negligible.



a. 1082 N
b. 1151 N
c. 1166 N
d. 853 N