McRoberts Secondary

Dynamics Unit Test 2025-11-12

Personal Data

Family Name:

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0 1 2 3 4 5 6 7 8 9

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

Scrambling 0 0

Type: 020

Exam ID(Physics 11): 25111200003

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	☐	☐		
2	☐	☐		
3	☐	☐		
4	☐	☐	☐	☐
5	☐	☐	☐	☐
6	☐	☐	☐	☐
7	☐	☐	☐	☐
8	☐	☐	☐	☐
9	☐	☐	☐	☐
10	☐	☐	☐	☐
11	☐	☐	☐	☐
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? 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. A golf club hits a golf ball with a force of 2400 N. The golf ball hits the club with a force
    a. 2400 N
    b. less than 2400 N
    c. not enough information to determine
    d. more than 2400 N
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. $\mu_s < \mu_k$
    c. $\mu_k < \mu_s$
    d. The inertia of the box is greater when it is at rest.
7. An apple is falling straight down toward the ground. Take the weight of the apple to be the action force. What is the reaction force?
    a. The air resistance pushing up on the apples.
    b. The force of impact when the object hits the ground.
    c. There is no reaction force because the apple is not touching anything.
    d. The apple's gravity pulling upward on the Earth.
8. What is the net force on a person who is standing in an elevator moving up with a constant velocity of 5.00 m/s?
    a. It depends on the mass of the person.
    b. 5.00 N, up
    c. 5.00 N, down
    d. 0 N

9. An object weighs 27 N on Earth. What is its mass?

    a. 2.8 kg
    b. 220 kg
    c. 27 kg
    d. 260 kg

10. A net force of 82.0 N acts on an object of mass 7.00 kg. What is the acceleration of the object?

    a. $12.0\,\mathrm{m/s^2}$
    b. $15.0\,\mathrm{m/s^2}$
    c. $13.0\,\mathrm{m/s^2}$
    d. $6.8\,\mathrm{m/s^2}$

11. An box slides down an inclined plane with a constant velocity. The angle of incline is 38.0°. What is the coefficient of kinetic friction between the box and the inclined plane?

    a. 0.022
    b. 0.974
    c. 0.403
    d. 0.781

12. A person (mass = 105 kg) stands on top of a box (mass = 9.0 kg) on the ground. What is the magnitude of the normal force that the ground applies to the box?

    a. 114 N
    b. 1160 N
    c. 1310 N
    d. 1120 N

13. Adam pulls on a box with 6.0 N of force. Bob pulls on the the same box with 3.0 N of force, at a right angle to Adam's force. What is the magnitude of the net force on the box?

    a. 7.6 N
    b. 6.7 N
    c. 9 N
    d. 4.8 N

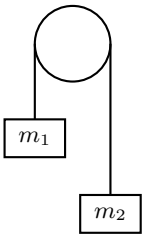
14. Carly pulls on a box with 16.0 N of force. Debby pulls on the the same box at a right angle to Carly. How hard must Debby pull to make the resultant force on the box 24.0 N?

    a. 8.0 N
    b. 17.9 N
    c. 10.8 N
    d. 40.0 N

15. Charlie pulls on a box with 52.0 N of force at 138°. Dan pulls on the the same box with 49.0 N of force at -73°. What is the angle of the net force on the box?

    a. 98.9°
    b. 12.3°
    c. -153.6°
    d. 134.8°

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 $\mathrm{m}_1 = 60.0$ kg and $\mathrm{m}_2 = 57.0$ kg. The hanging masses are free to move. What is the magnitude of the acceleration of the system?



    a. 0.25 m/s/s
    b. 0.19 m/s/s
    c. 0.22 m/s/s
    d. 0.15 m/s/s

17. Two forces act on an object. A 56.0-N force acts at -74°. A 90.0-N force acts at -178°. What is the angle of their equilibrant?

    a. 74.6°
    b. 37.4°
    c. 169.3°
    d. 39.3°

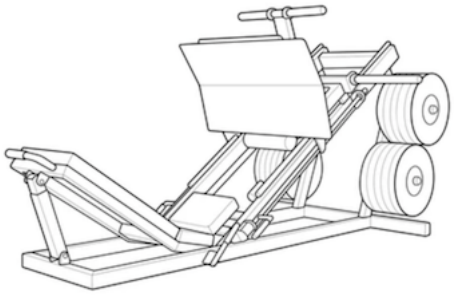
18. A box of mass 16 kg slides down a frictionless inclined plane. The angle of incline is 16° from the horizontal. What is the acceleration of the box?

    a. $2.6\,\mathrm{m/s^2}$
    b. $1.9\,\mathrm{m/s^2}$
    c. $2.7\,\mathrm{m/s^2}$
    d. $1.8\,\mathrm{m/s^2}$

19. A box of mass 29 kg slides down an inclined plane with friction. The angle of incline is 54° and $\mu_\mathrm{k} = 0.37$. What is the acceleration of the box?

    a. $5.8\,\mathrm{m/s^2}$
    b. $0.1\,\mathrm{m/s^2}$
    c. $3.3\,\mathrm{m/s^2}$
    d. $8.4\,\mathrm{m/s^2}$

20. A leg press machine is inclined at 47.0° from the horizontal. The total mass to be pressed up is 101.0 kg. What force must the legs apply to move the mass at a constant velocity? Assume that friction is negligible.



a. 973 N
b. 101 N
c. 724 N
d. 940 N