McRoberts Secondary

Dynamics Unit Retest 2025-11-26

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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): 25112600004

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 in equilibrium (i.e. all the forces on it are balanced), then the object must be at rest.

    a. True
    b. False

2. True or false? An object weighs less on the moon than it does on earth.

    a. True
    b. False

3. True or false? A ball is thrown upwards and rightwards. While it is in the air, the net force on the ball is directed upwards and rightwards.

    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 value 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. more than 2400 N
    b. not enough information to determine
    c. 2400 N
    d. less 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. The inertia of the box is greater when it is at rest.
    c. $\mu_s < \mu_k$
    d. $\mu_k < \mu_s$

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. There is no reaction force because the apple is not touching anything.
    b. The force of impact when the object hits the ground.
    c. The apple's gravity pulling upward on the Earth.
    d. The air resistance pushing up on the apple.

8. What is the net force on a person who is standing in an elevator moving up with a constant velocity of 4.00 m/s?

    a. It depends on the mass of the person.
    b. 4.00 N, down
    c. 4.00 N, up
    d. 0 N

9. You place a 84.65-kg object on a spring scale. If the scale reads 392.4 N, what is the acceleration of gravity at that location?

    a. $6.7\,\mathrm{m/s^2}$
    b. $2.9\,\mathrm{m/s^2}$
    c. $5.96\,\mathrm{m/s^2}$
    d. $4.64\,\mathrm{m/s^2}$

10. An object of mass 3.0 kg accelerates at $18.0\,\mathrm{m/s^2}$. What is the magnitude of the net force on the object?

    a. 74 N
    b. 27 N
    c. 54 N
    d. 67 N

11. An box is at rest on an inclined plane. The angle of incline is increased slowly. When the angle reaches 46.0°, the box begins to slide. What is the coefficient of static friction between the box and the inclined plane?

    a. 1.510
    b. 1.036
    c. 1.181
    d. 1.287

12. As the angle of an inclined plane increases, the parallel force _____ and the perpendicular force _____.

    a. decreases, decreases
    b. decreases, increases
    c. increases, decreases
    d. increases, increases

13. Adam pulls on a box with 20.0 N of force. Bob pulls on the the same box with 2.0 N of force, at a right angle to Adam's force. What is the magnitude of the net force on the box?

    a. 12.7 N
    b. 17.1 N
    c. 20.1 N
    d. 14.8 N

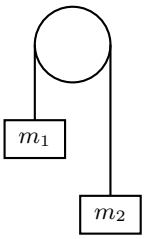
14. Xavier pulls on a box with 20.0 N of force at 0°. Yuri pulls on the the same box with 44.0 N of force, at 90°. What is the angle of the net force?

    a. 86.4°
    b. 87.7°
    c. 77.1°
    d. 66.0°

15. Robert pulls on a box with 46.0 N of force at 344°. Steve pulls on the the same box with 97.0 N of force at 75°. What is the magnitude of the net force on the box?

    a. 97.5 N
    b. 102.9 N
    c. 107 N
    d. 117.6 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 $\mathrm{m_1} = 76.0$ kg and $\mathrm{m_2} = 64.0$ kg. The hanging masses are free to move. What is the tension in the cord?



    a. 1020 N
    b. 681 N
    c. 793 N
    d. 851 N

17. Two forces act on an object. A 20.0-N force acts at 113°. A 99.0-N force acts at 71°. What is the angle of their equilibrant?

    a. $-175.3°$
    b. $-71.9°$
    c. 146.7°
    d. $-102.3°$

18. A box of mass 34 kg slides down a frictionless inclined plane. The angle of incline is 49° from the horizontal. What is the acceleration of the box?

    a. 7.4 $\mathrm{m/s^2}$
    b. 10.7 $\mathrm{m/s^2}$
    c. 8.0 $\mathrm{m/s^2}$
    d. 8.1 $\mathrm{m/s^2}$

19. A box of mass 48 kg slides down an inclined plane with friction. The angle of incline is 60° and $\mu_\mathrm{k} = 1.3$. What is the acceleration of the box?

    a. 2.1 $\mathrm{m/s^2}$
    b. 0.9 $\mathrm{m/s^2}$
    c. 0.8 $\mathrm{m/s^2}$
    d. 1.3 $\mathrm{m/s^2}$

20. An 4.9-kg box slides down a 20° inclined plane with constant acceleration. The box starts from rest at the top. At the bottom, its velocity reaches 1.7 m/s. The length of the incline is 1.19 m. What is the coefficient of kinetic friction between the box and the plane?

    a. 0.286
    b. 0.232
    c. 0.347
    d. 0.319