McRoberts Secondary

Dynamics Unit Retest 2025-11-26

Personal Data

Family Name:

Given Name:

Signature:

checked

Registration Number

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1	☐	☐	☐	☐	☐	☐	☐	1
2	☐	☐	☐	☐	☐	☐	☐	2
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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): 25112600002

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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10	☐	☐	☐	☐
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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 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? 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 value greater 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 97 kg pushes on a wall with 76 N of force. What is the magnitude of the force that the wall exerts on the person?

    a. 740 N
    b. 7.8 N
    c. 76 N
    d. 950 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. A force equal to the gravity acting on it.
    b. Cannot be determined without more information.
    c. A force equal to its weight on Earth, mg.
    d. The net force is zero.

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

8. A box, of mass M, is suspended by a string from the ceiling inside an elevator. The elevator is traveling downward with a constant speed. The tension in the string is

    a. less than Mg.
    b. equal to Mg.
    c. greater than Mg.
    d. impossible to determine without knowing the speed.

9. You place a 28.06-kg object on a spring scale. If the scale reads 373.2 N, what is the acceleration of gravity at that location?

   a. $13.3\,\mathrm{m/s^2}$
   b. $17.24\,\mathrm{m/s^2}$
   c. $10.3\,\mathrm{m/s^2}$
   d. $7.17\,\mathrm{m/s^2}$

10. An object of mass 11.0 kg accelerates at $1.0\,\mathrm{m/s^2}$. What is the magnitude of the net force on the object?

    a. 7.3 N
    b. 11 N
    c. 12 N
    d. 15 N

11. An box is at rest on an inclined plane. The angle of incline is increased slowly. When the angle reaches 10.0°, the box begins to slide. What is the coefficient of static friction between the box and the inclined plane?

    a. 0.208
    b. 0.138
    c. 0.176
    d. 0.095

12. What force is needed to keep a 22-kg box moving at a constant velocity across a warehouse floor if the coefficient of kinetic friction between the box and the floor is 0.61?

    a. 130 N
    b. 110 N
    c. 13 N
    d. 45 N

13. Adam pulls on a box with 12.0 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. 13.9 N
    b. 7.5 N
    c. 10.7 N
    d. 8.9 N

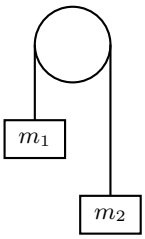
14. Xavier pulls on a box with 39.0 N of force at 0°. Yuri pulls on the the same box with 35.0 N of force, at 90°. What is the angle of the net force?

    a. 43.0°
    b. 80.6°
    c. 42.0°
    d. 47.5°

15. Robert pulls on a box with 64.0 N of force at 166°. Steve pulls on the the same box with 22.0 N of force at 351°. What is the magnitude of the net force on the box?

    a. 63.1 N
    b. 45.3 N
    c. 56.6 N
    d. 42.1 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 $\mathrm{m_1} = 46.0$ kg and $\mathrm{m_2} = 90.0$ kg. The hanging masses are free to move. What is the tension in the cord?



    a. 513 N
    b. 302 N
    c. 386 N
    d. 597 N

17. Two forces act on an object. A 99.0-N force acts at -47°. A 94.0-N force acts at -135°. What is the angle of their equilibrant?

    a. 90.4°
    b. 66.6°
    c. -158.0°
    d. 8.9°

18. A box of mass 61 kg slides down a frictionless inclined plane. The angle of incline is 72° from the horizontal. What is the acceleration of the box?

    a. $9.3\,\mathrm{m/s^2}$
    b. $10.6\,\mathrm{m/s^2}$
    c. $8.1\,\mathrm{m/s^2}$
    d. $10.7\,\mathrm{m/s^2}$

19. A box of mass 98 kg slides down an inclined plane with friction. The angle of incline is 34° and $\mu_\mathrm{k} = 0.26$. What is the acceleration of the box?

    a. $3.4\,\mathrm{m/s^2}$
    b. $7.2\,\mathrm{m/s^2}$
    c. $0.8\,\mathrm{m/s^2}$
    d. $1.1\,\mathrm{m/s^2}$

20. An 8.2-kg box slides down a 15° inclined plane with constant acceleration. The box starts from rest at the top. At the bottom, its velocity reaches 1.74 m/s. The length of the incline is 3.49 m. What is the coefficient of kinetic friction between the box and the plane?

    a. 0.222
    b. 0.260
    c. 0.332
    d. 0.191