



McRoberts Secondary



Physics 12 Statics Unit Test 2025-10-02



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Registration Number

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

Scrambling

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Exam ID(Physics 12)

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Only clearly marked and positionally accurate crosses will be processed!

Answers 1 - 15

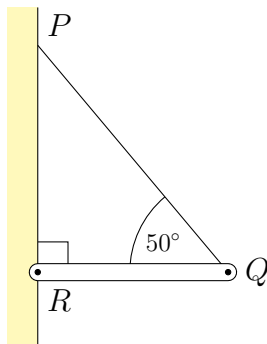
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Answers 16 - 20

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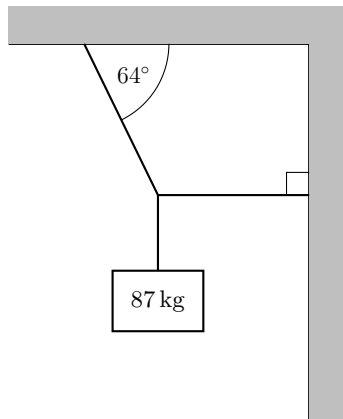


1. A heavy seesaw is out of balance. A lightweight child sits on the end that is tilted downward, and a heavy child sits on the other side so that the seesaw now balances. If both children then move forward so that they are at half of their original distance from the pivot, what will happen to the seesaw?
 - a. The side the heavy child is sitting on will now tilt downward.
 - b. The seesaw will still be balanced.
 - c. It is impossible to determine without knowing the masses and distances.
 - d. The side the lightweight child sitting on will once again tilt downward.
2. A 8.0 m long uniform beam of mass 30.0 kg, QR, is mounted by a hinge on a wall and held in a horizontal position by wire PQ, forming a 50° angle at point Q as shown in the figure. What is the magnitude of the force that the hinge exerts on the beam at point R?

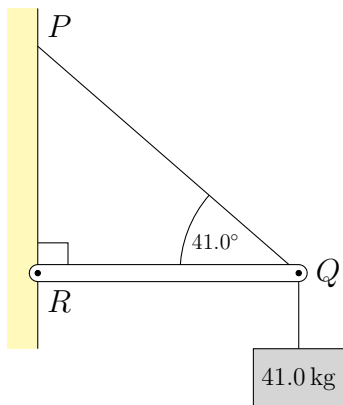


- a. 190 N
 - b. 19 N
 - c. 380 N
 - d. 280 N
3. A heavy seesaw is balanced with no one sitting on it. Then, a lightweight child sits on one side and a heavy child sits on the other side. They sit at different distances from the pivot so that the seesaw remains balanced. Now, if both children move forward so that they are at half of their original distance from the pivot, what will happen to the seesaw?
 - a. It is impossible to determine without knowing the masses and distances.
 - b. The side the lightweight child sitting on will tilt downward.
 - c. The seesaw will still be balanced.
 - d. The side the heavy child is sitting on will tilt downward.
4. Two scales are separated by 3.0 m, and a plank of mass 6.0 kg is placed between them. Each scale is observed to read 3.0 kg. A rock is placed somewhere on the plank, after which the left scale reads 30.0 kg and the right scale reads 90.0 kg. How far from the left scale was the rock placed?
 - a. 2.29 m
 - b. 2.54 m
 - c. 0.52 m
 - d. 2.93 m
5. A book weighs 2 N at the surface of the Earth. When held at rest on top of your head, the net force on the book is
 - a. -2 N
 - b. 0 N
 - c. 2 N
 - d. 9.8 N

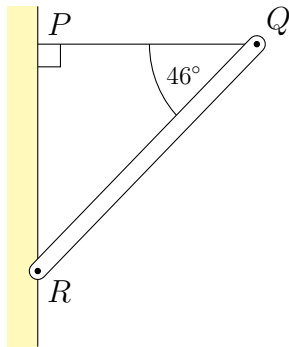
6. A box of mass 87 kg hangs down from three attached cords secured to the ceiling and wall as shown in the diagram. Find the maximum tension in any one of the three cords.



- a. 1400 N
b. 949 N
c. 1410 N
d. 1070 N
7. A 7.0 m long uniform beam of mass 7.00 kg, QR, is mounted by a hinge on a wall and held in a horizontal position by wire PQ, forming a 41.0° angle at point Q as shown in the figure. A load of mass 41.0 kg hangs vertically down from point Q. What is the magnitude of the tension in wire PQ?



- a. 665 N
b. 203 N
c. 1330 N
d. 160 N
8. A 1.0 m long uniform beam of mass 95 kg (QR) is mounted by a hinge on a wall and held in position by a horizontal wire (PQ), forming a 46° angle at point Q as shown in the figure. What is the tension in the horizontal wire PQ?

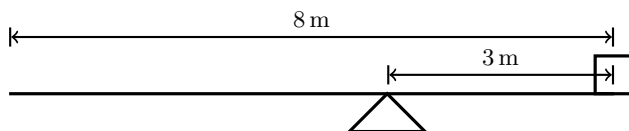


- a. 450 N
- b. 199 N
- c. 45 N
- d. 4500 N

9. A boy and a girl are balanced on a massless seesaw. The boy's mass is 46 kg and the girl's mass is 30 kg. If the boy is sitting 1.4 m from the pivot, how far from the pivot must the girl be sitting on the other side of the seesaw?

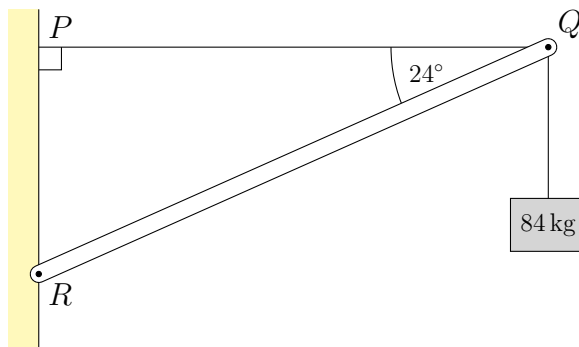
- a. 1.8 m
- b. 1.4 m
- c. 2.1 m
- d. 1.7 m

10. A lever is 8 m long. The distance from the fulcrum to the load to be lifted is 3 m. If a worker pushes on the opposite end with 1000 N, what is the maximum weight that can be lifted?

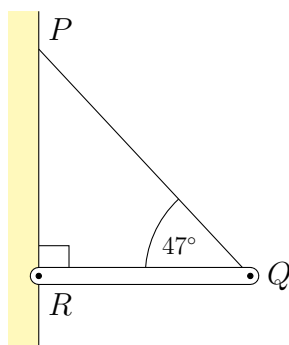


- a. 1670 N
- b. 600 N
- c. 2470 N
- d. 2640 N

11. A uniform beam QR, 2.0 m long with negligible mass, is mounted by a hinge on a wall and held in position by a horizontal wire PQ as shown in the figure. The beam supports a load of mass 84 kg hanging vertically down from point Q. What is the tension in the horizontal wire PQ?

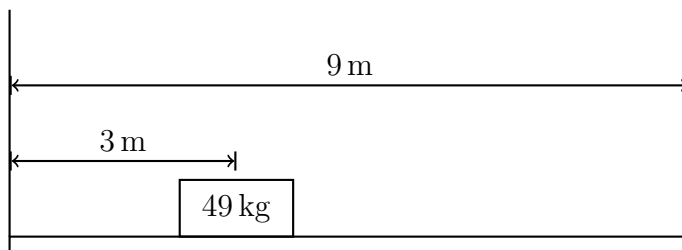


- 1850 N
 - 3280 N
 - 2170 N
 - 2740 N
12. What conditions are necessary for a body to be in static equilibrium? Note that $\sum \vec{F}$ is the net force on the body and $\sum \vec{\tau}$ is the net torque on the body.
- $\sum \vec{F} = 0$
 - $\sum \vec{\tau} = 0$
 - $\sum \vec{F} = 0$ and $\sum \vec{\tau} = 0$
 - $\sum \vec{F} = 0$ or $\sum \vec{\tau} = 0$ (but not both)
13. A person weighing 573 N stands with one foot on each of two bathroom scales. Which statement is correct about this situation?
- Each scale should read 573 N
 - The sum of the two scale readings should be 573 N
 - Each scale should read 286.5 N
 - None of the other statements are true.
14. A 3.0 m long uniform beam of mass 1.0 kg, QR, is mounted by a hinge on a wall and held in a horizontal position by wire PQ, forming a 47° angle at point Q as shown in the figure. What is the magnitude of the tension in wire PQ?

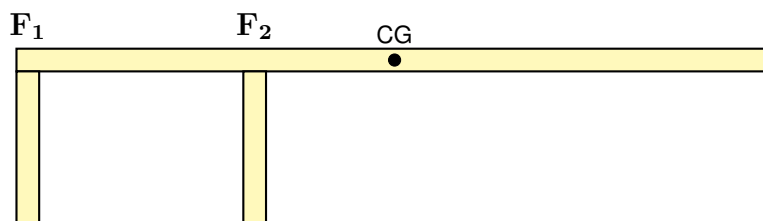


- 6.7 N
- 2.8 N
- 0.67 N
- 13 N

15. A scaffold of negligible mass is hanging horizontally from wires on each end. The scaffold is 9 m long. A 49 kg box sits 3 m from the left end. What is the tension in the left wire?

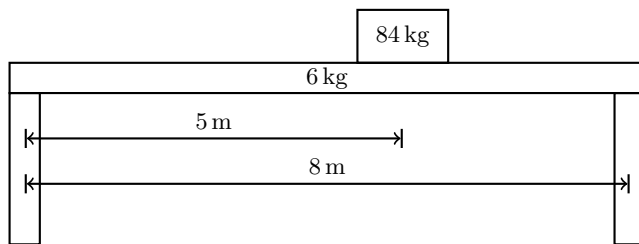


- 320 N
 - 100 000 N
 - 119 000 N
 - 122 000 N
16. A cantilever is held in static equilibrium by two vertical supports as shown in the figure. The beam is fastened to the supports with screws so that each support could apply an upward or downward force. The centre of gravity (CG) of the beam is to the right of the second support. In which direction must F_1 and F_2 point to keep the beam in static equilibrium?



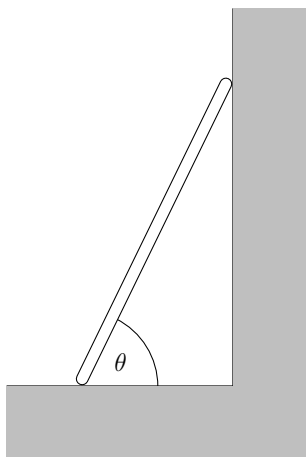
- F_1 and F_2 both point upward
 - F_1 and F_2 both point downward
 - F_1 points upward while F_2 points downward
 - F_1 points downward while F_2 points upward
17. A heavy child and a lightweight child are balanced on a massless seesaw. If both children move forward so that they are at half of their original distance from the pivot, what will happen to the seesaw?
- The seesaw will still be balanced.
 - The side the lightweight child is sitting on will tilt downward.
 - The side the heavy child is sitting on will tilt downward.
 - It is impossible to determine without knowing the masses and distances.
18. A uniform 6 kg beam, 8 m long, supports a 84 kg box. The beam is supported by two vertical columns and the centre of gravity of the box is 5 m from the left column. Calculate the force

on the right column.



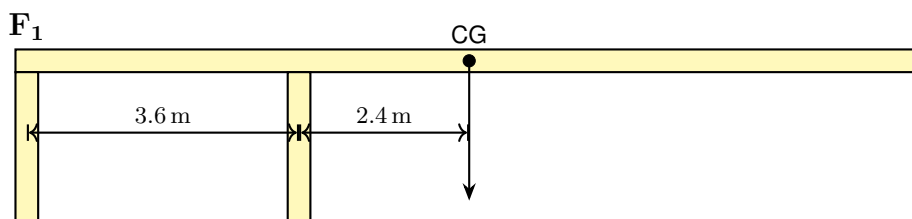
- a. 3290 N
- b. 1150 N
- c. 544 N
- d. 5030 N

19. A uniform ladder of mass 7 kg and length 3 m leans against a frictionless wall. Let θ be the angle that the ladder makes with the ground. If the coefficient of static friction between the ladder and the ground is 0.47, what is the minimum value of θ at which the ladder will not slip?



- a. 48°
- b. 41°
- c. 32°
- d. 47°

20. A cantilever beam is held in static equilibrium by two vertical supports separated by 3.6 m. The beam's mass is 53 kg and its centre of gravity (CG) is 2.4 m from the second support. What is the magnitude of the force applied by the first support, F_1 ?



- a. 150 N
- b. 35 N
- c. 280 N
- d. 350 N