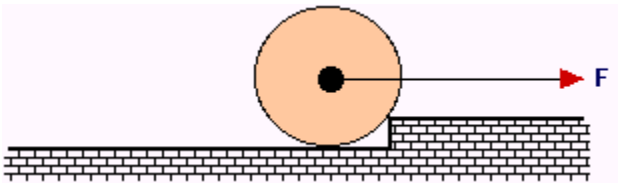
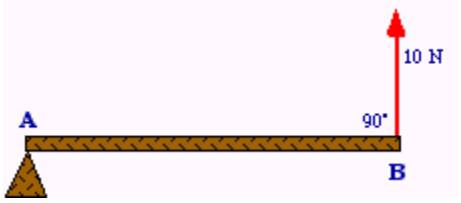
Name: _____ Practice Ph12 3-1



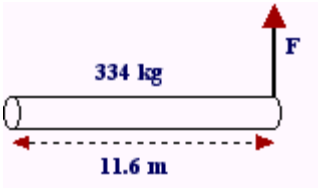
1. What force will just start the 4.0 kg, 20 cm radius ball rolling up over the 12 cm high curb?

2. What is the torque acting on the 1.0 m bar 'AB' shown below because of the 10.0 N force?



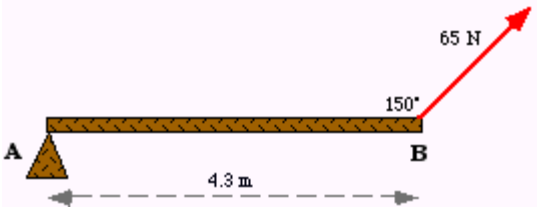
A. 8.7 Nm
B. 9.8 Nm
C. 10 Nm
D. 5.0 Nm

3. The diagram at right shows a beam of uniform cross-section resting on the ground. Its mass is 334 kg and its length is 11.6 m. What must be the force of tension in the cable to just lift the end of the beam off the ground?



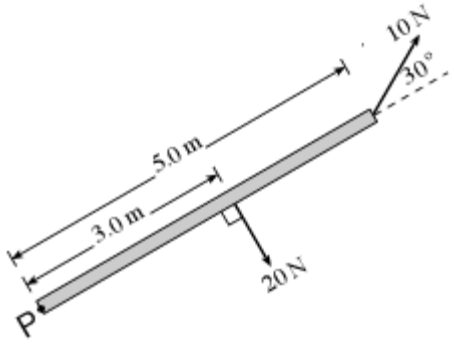
A. 3.27×10^3 N
B. 1.64×10^3 N
C. 8.18×10^3 N
D. 1.67×10^2 N

4. What is the torque acting on the 4.3 m bar 'AB' shown below because of the 65 N force?



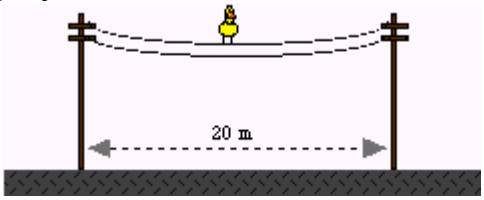
A. 242 Nm
B. 280 Nm
C. 140 Nm
D. 161 Nm

5. Determine the sum of the torques about the point P for the two forces shown below acting on a very light wooden beam. (Ignore its weight.)



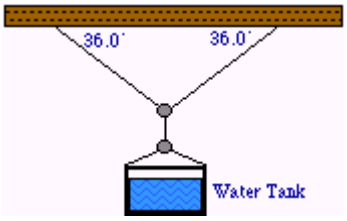
A. 17 N•m
B. 10 N•m
C. 85 N•m
D. 35 N•m

6. A bird sits on a telephone wire midway between two poles that are 20 m apart. The wire, assumed to be weightless, sags by 0.5 m.



If the tension in the wire is 90 N, what is the mass of the bird (in kg)?

7. The diagram below shows a water tank suspended by two strings. If the force of gravity on the tank is 290 N, what is the tension in each wire?

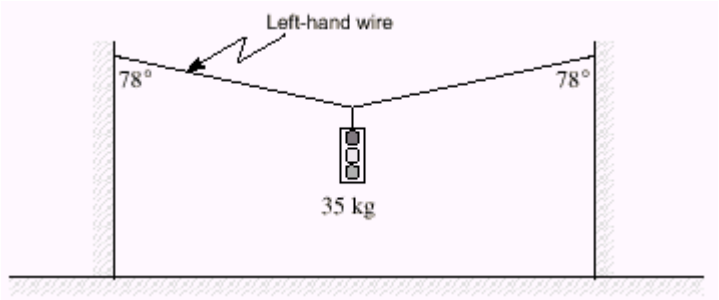


A. 2.1×10^2 N
B. 1.7×10^2 N
C. 3.6×10^2 N
D. 2.5×10^2 N

8. A 75 kg traffic light is held stationary midway between two supports. The cord forms an angle of 80° with the vertical on each wall. What is the tension in the cord?

A. 4.2×10^3 N
B. 3.7×10^2 N
C. 7.4×10^2 N
D. 2.1×10^3 N

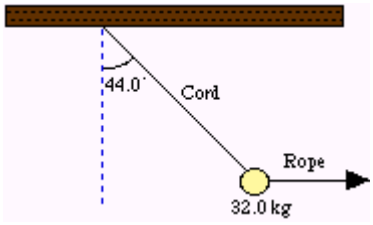
9. A 35 kg traffic light is suspended by two wires as shown.



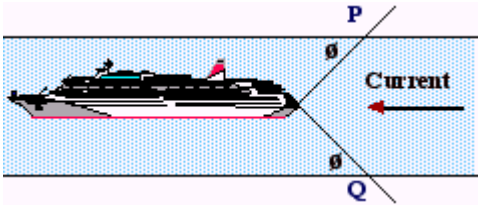
What is the tension in the left-hand wire?

A. 410 N
B. 84 N
C. 1 600 N
D. 820 N

10. What is the force of tension (in Newtons) in the cord?



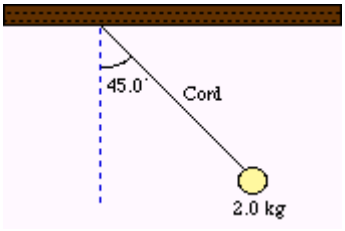
11.



The above diagram shows a canal boat being held stationary by two ropes anchored at P and Q. For which of the following values of ø will the force of tension in the ropes be least?

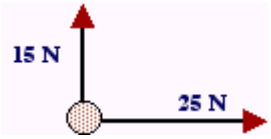
A. 45◦
B. 30◦
C. 90◦
D. 60◦

12. A 2.0 kg mass is suspended from the roof of a railroad car by a 1.6 m string forming a 45° angle with the vertical. Calculate the acceleration of the railroad car.

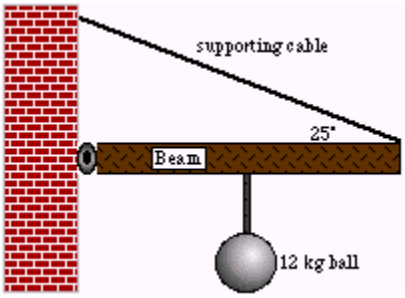


A. 13.9 m/s^2
B. Zero because the mass is in a state of equilibrium.
C. 6.9 m/s^2
D. 9.8 m/s^2

13. Two forces act on an object as shown in the diagram. In what direction must a third force act on the object if the object is to be in equilibrium?

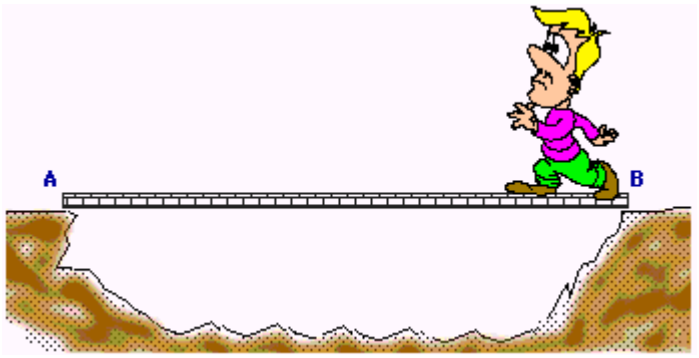


A. 59◦ below the horizontal
B. 31◦ above the horizontal
C. 59◦ above the horizontal
D. 31◦ below the horizontal



14. Calculate the tension in supporting cable (in Newtons) if the 12.0 kg ball is hanging from the middle of the uniform 5.00 kg beam.

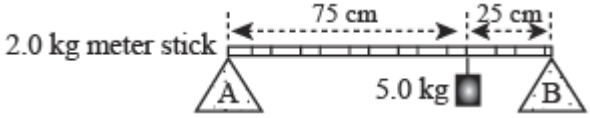
15.



The bank at point 'A' can support only 600 N. How far would our 60 kg, friend get from 'B' on the 20 kg, 6.0 m beam before the bank at 'A' gives away?

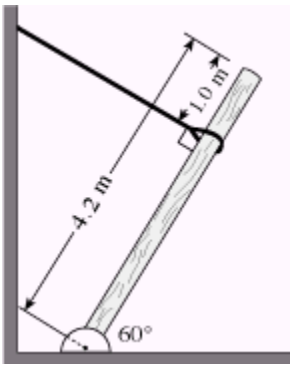
Use the following information to answer the next 1 question(s).

A 2.0 kg meter stick has a 5.0 kg mass suspended from the 75 cm mark. Support 'A' is at the zero mark and support 'B' is at the 100 cm mark.



16. Calculate the total vertical force.
    A. 22 N
    B. 0.0 N
    C. 69 N
    D. 47 N

17. A 4.2 m long uniform post is supported by a cable having a tension of 1 700 N. What is the mass of this post?



    A. 530 kg
    B. 160 kg
    C. 260 kg
    D. 300 kg

18. A metre stick, as seen from above, is sitting on a table and is then subjected to two forces of equal magnitude as shown. In which case would the metre stick be in rotational equilibrium?

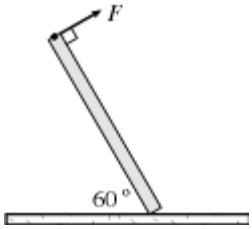
A. 

B. 

C. 

D. 

19. The 0.10 kg metre stick shown below is held up by the perpendicular force F. The bottom of the metre stick is on the verge of sliding to the right.



Determine the size of the friction force being provided by the floor.

A. 0.49 N
B. 0.25 N
C. 0.21 N
D. 0.12 N

20. Which of these is an acceptable definition of rotational equilibrium?

A. $\Sigma F_x = \Sigma F_y$

B. $\Sigma t = 0$

C. $\Sigma v = 0$

D. $\Sigma F = \Sigma t$