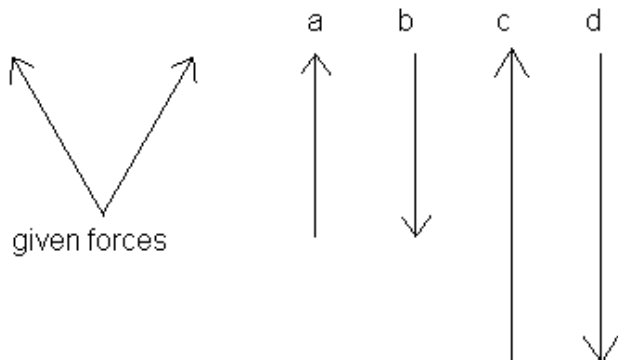


Assignment 7: Static Equilibrium
Outcome ACP 1

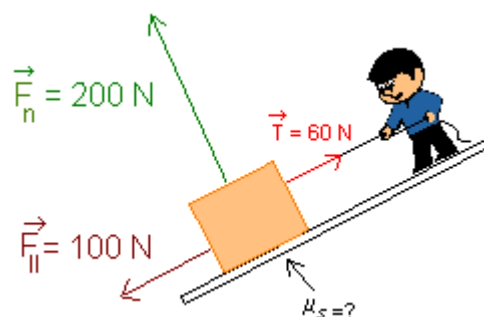
Name: _____

1. For the two forces shown, what is the best representation of the equilibrant force?



2. From the information in the picture to the right, what must be the coefficient of static friction in order for the block to be in static equilibrium?

- A 0.2
- B 0.3
- C 0.4
- D 0.5

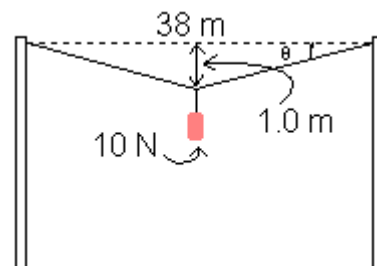


3. In which situation will an object be in static equilibrium?

- A bouncing
- B falling
- C motionless
- D rotating

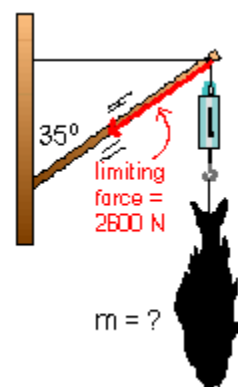
4. A 10 N clothes pin bag attached to the middle of a 38 m line causes it to sag 1.0 m. What tension is in each half of the clothes line due to the bag?

- A 5.0 N
- B 96 N
- C 190 N
- D 380 N



5. The boom in the picture will break if the force in it goes above 2600 N. What is the mass of the largest fish that can be attached to the scales without breaking the structure?

- A 150 kg
- B 220 kg
- C 1500 kg
- D 2200 kg

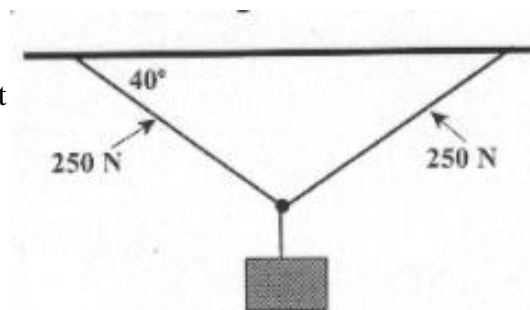


6. What is the single point at which the entire mass of a body is considered to be located?

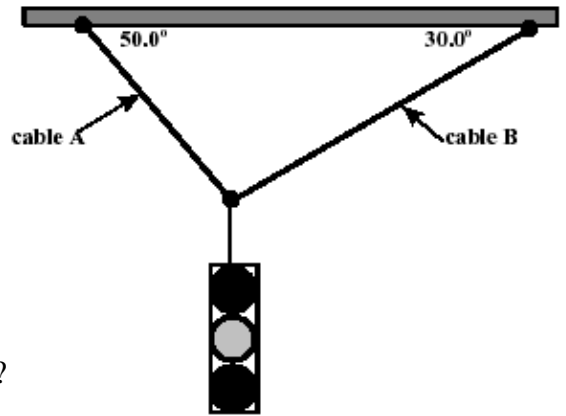
- A center of mass
- B center of rotation
- C mass point
- D moment of force

7. An object is suspended by cords as shown in the diagram below. If the tension in each of the two cords is 250 N, what is the weight of the object?

- A 160 N
- B 320 N
- C 380 N
- D 500 N



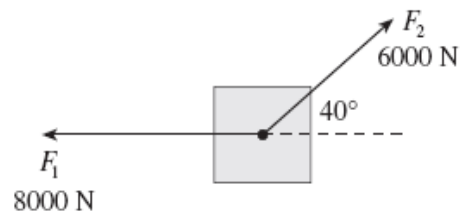
8. In the diagram below, the tension in cable A is $3.20 \times 10^2 \text{ N}$ and the tension in cable B is $2.40 \times 10^2 \text{ N}$. What is the mass of the traffic light?
- A 33.3 kg
 B 37.3 kg
 C 42.1 kg
 D 46.2 kg



9. What condition(s) is necessary for static equilibrium?
- A $\Sigma F_x = 0$
 B $\Sigma F_x = 0, \Sigma \tau = 0,$
 C $\Sigma \tau = 0, \Sigma F_x = 0, \Sigma F_y = 0$
 D $\Sigma \tau = 0, \Sigma F_y = 0$

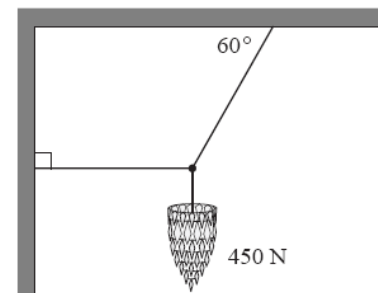
10. Two forces are acting at a single point on an object. Force 1 has a magnitude of 8000 N and is directed due W. Force 2 has a magnitude of 6000 N and is directed at 40° N of E. Determine the magnitude of the third force which must act at the same point so that the object will be in translational equilibrium.

- A 2000 N
 B 3400 N
 C 5100 N
 D 6200 N

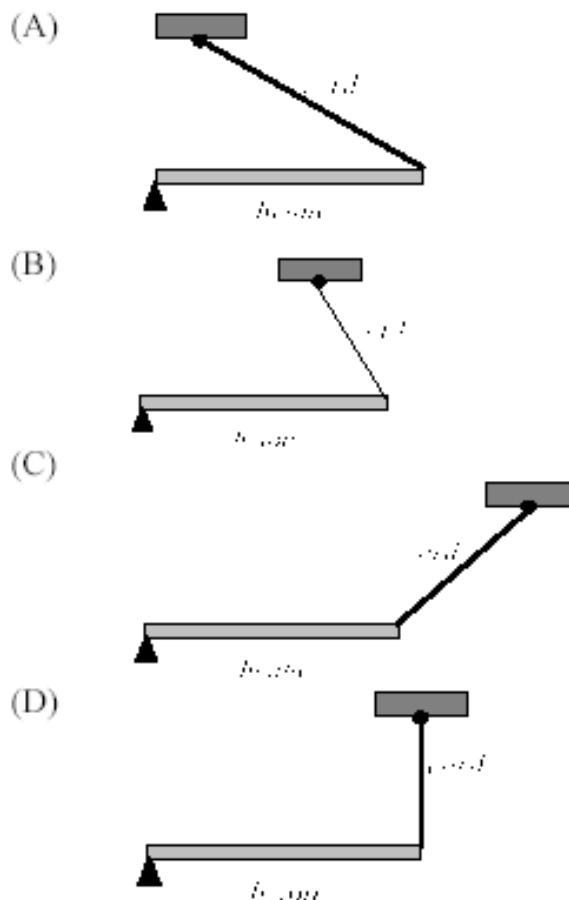


11. A 450 N chandelier is supported by three cables as shown in the diagram. What is the tension in the horizontal cable?

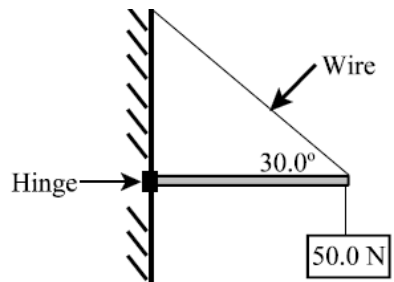
- A 46 N
 B 260 N
 C 450 N
 D 520 N



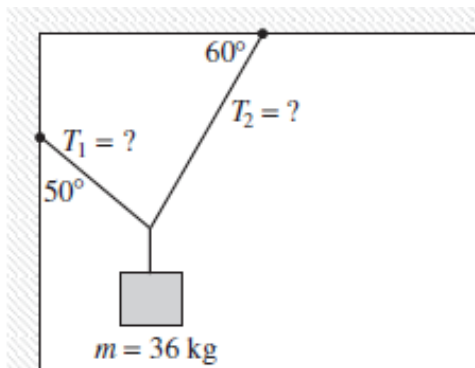
12. If a beam is kept horizontal by a cord, which situation has the least tension in the cord?



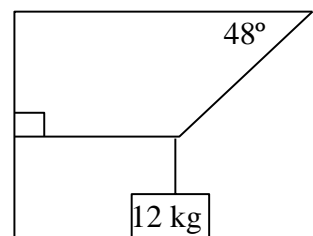
13. The wire below supports a horizontal massless beam.
What is the tension in the wire?
- A $2.89 \times 10^1 \text{ N}$
 B $5.00 \times 10^1 \text{ N}$
 C $5.77 \times 10^1 \text{ N}$
 D $1.00 \times 10^2 \text{ N}$



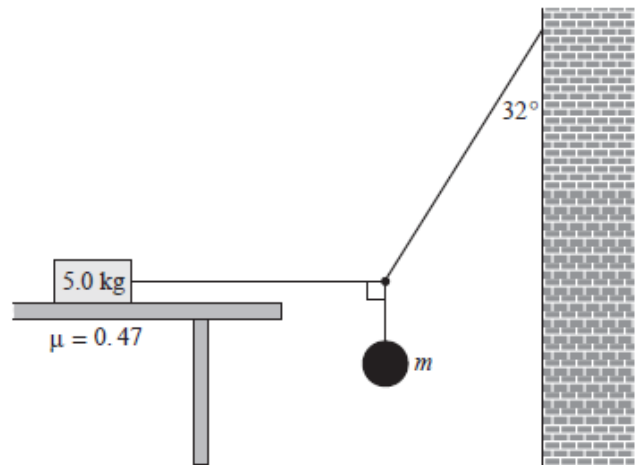
14. Calculate the tensions T_1 and T_2 in the two ropes holding the 36 kg mass as shown.



15. Calculate the tensions on the two cords that support the 12 kg mass as shown in the diagram.



16. An object of mass m , is suspended by two chords connected to a wall and to a 5.0 kg block resting on a table as shown. A coefficient of friction of 0.47 exists between the 5.0 kg block and the table. What is the maximum mass that can be hung from the cords before the 5.0 kg block begins to move?



17. Spring scales are used to measure the tension in each string supporting the 1.95 kg mass shown. Using calculations, determine whether the system is in static equilibrium.

