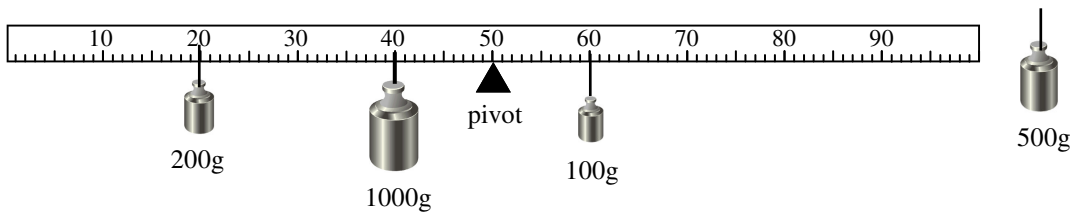
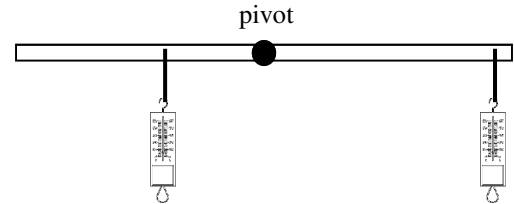


2011 PreAP Forces 9

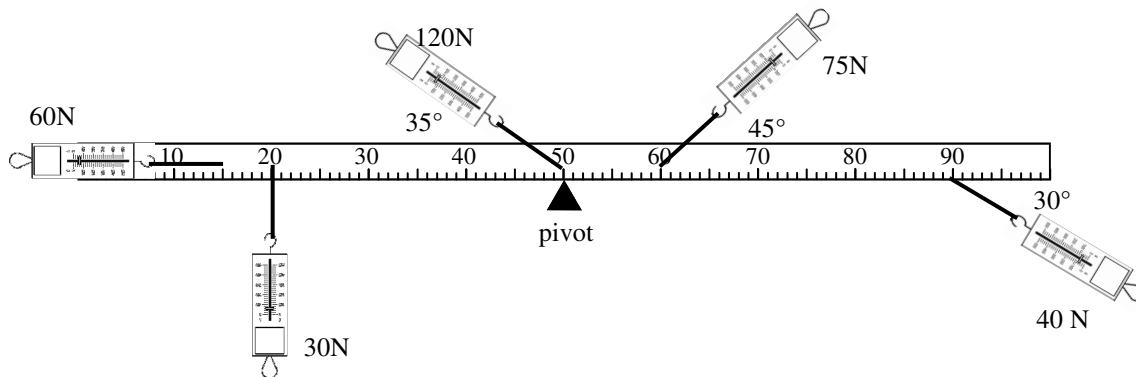


1. Where would you put the 500g mass to balance the lever?

2. Two forces are being applied to the lever at the left. The lever is not moving when both forces are applied.



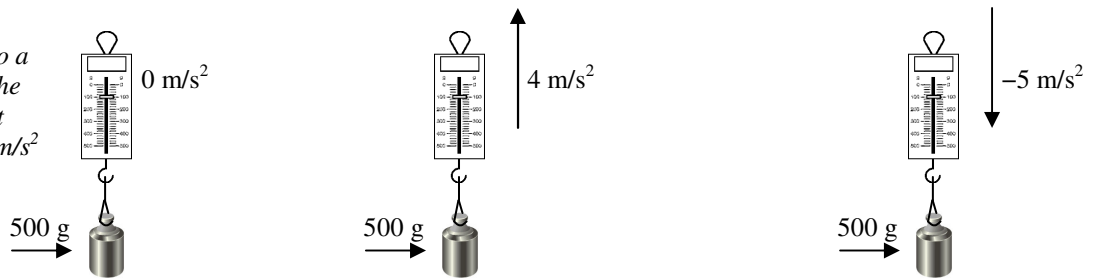
- A. Which spring scale gives positive torque?
- B. Which spring scale gives more torque?
- C. Which spring scale shows more force?
- D. If the left scale is turned so that its angle is no longer 90° but the force remains constant, what would happen to the lever?



- 3. A. * Does the 30 N force provide a positive or negative torque?
- B. * On the diagram, calculate the individual torques on the lever above.
- B. * Calculate the net torque on the lever above.

A 500 g object is attached to a spring scale by a string. The mass is given three different accelerations. Use $g = 10 \text{ m/s}^2$

Big Hint:
 $1000\text{g} = 1 \text{ kg}$
 (work in kilograms)



4. A. * Calculate the tension in the string when $a = 0 \text{ m/s}^2$. (Do your dot and diagram for the mass only.)

5. A. Calculate the tension in the string if the $a = 4 \text{ m/s}^2$.

6. A. Calculate the tension in the string if the $a = -5 \text{ m/s}^2$.

B. Does the scale read more, less, or the same as the weight of the object?

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3A) The 30 N force causes CCW rotation which give + torque.

3B) The 60 N force gives no torque; The 40 N force give -8Nm of torque ($\tau = -40(.4)\sin 30^\circ$) Figure out the others.

3C) 6.3 Nm total

4A) $mg = 5\text{ N}$ ($500\text{g} = 0.5\text{ kg}$) $T = 5\text{ N}$, which is the same as the weight: $T - mg = m(0)$