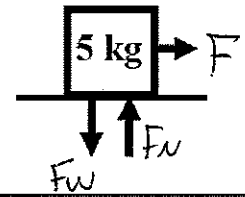


1.  $F, T, F_w, F_f, \text{ or } F_N?$

- |                                  |   |
|----------------------------------|---|
| $F_N$ Normal force               | $F_N$ A surface pushing up from below.      |
| $F_f$ Force of friction          | $F$ Any push or pull.                       |
| $F_w$ Weight                     | $F_f$ Resists change of motion.             |
| $F$ Applied force                | $F_f$ Increases with rough surfaces.        |
| $T$ Tension                      | $F_w$ Always pulls downward.                |
| $T$ Exerted by a string or rope. | $F_N$ Is always perpendicular to a surface. |
| $F_w$ Caused by gravity.         |   |
| $T$ Is equal throughout.         |   |

2. A mass is pulled to the right while on a table.

A. Label the forces.



B. Calculate the object's weight.

$$F_w = 5 \text{ kg} \cdot 10 \text{ m/s}^2 = 50 \text{ N}$$

3. Calculate the weight of a 7 kg object.

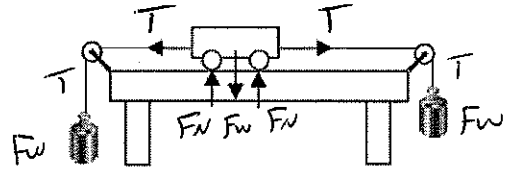
$$F_w = 7 \text{ kg} \cdot 10 \text{ m/s}^2 = 70 \text{ N}$$

4. Calculate the mass of a 65 N object.

$$F_w = mg$$

$$m = \frac{F_w}{g} = \frac{65 \text{ N}}{10 \text{ m/s}^2} = 6.5 \text{ kg}$$

5. A. Label the forces on the above object.



B. Which ones are y-direction forces?

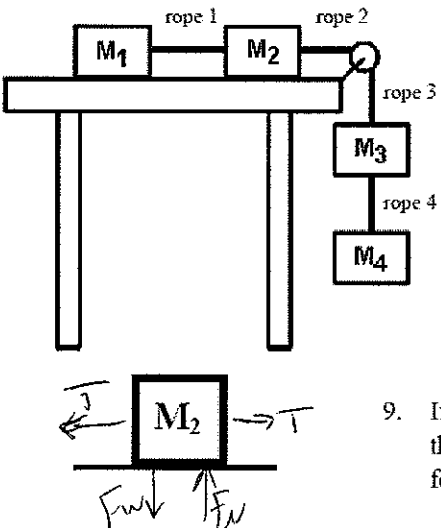
$F_w, F_N$

C. Which ones are x-direction forces?

$T$

10. Static friction, Kinetic friction, or Air friction?

- A. S/K Depends on the roughness of the surface.
- B. S Between tires and the road, normally.
- C. S When an object is at rest.
- D. K When an object slides.
- E. S Gripping friction.
- F. A Increases with speed.
- G. K When you slip on ice.
- H. All Resists the motion of an object.
- I. A Keeps a falling object from speeding up forever.

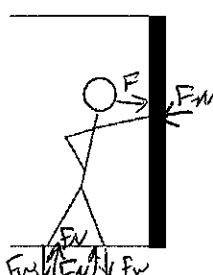


6. What force is acting on all four of the masses?  
 $F_w + T$

7. What force is NOT acting on the hanging masses?  
 $F_N$

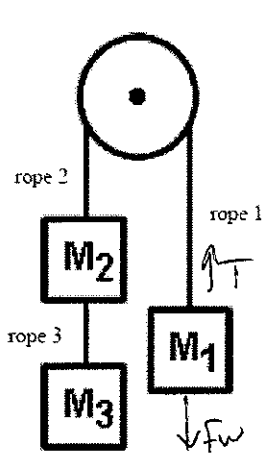
8. If  $M_1 = 2 \text{ kg}$ , what is  $F_{w1}$ ?  
 $20 \text{ N}$

9. If there IS friction on the table, draw the forces acting on  $M_2$ .



11. What kind of force is keeping the person from falling thru the wall?  
 $F_N$

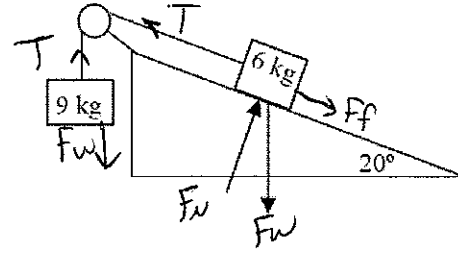
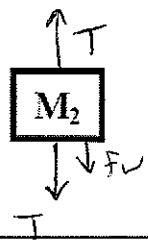
12. Draw all of the forces acting on the person.



13. What force cannot be acting on the objects?  
 $F_N$

14. On the diagram at the left draw all of the forces acting on  $M_1$ .

15. Draw the force diagram for  $M_2$  below.



16. Label the two shown forces acting on the 6 kg mass, giving actual numbers if you know them.

17. If the 9 kg object moves down and there IS friction on the ramp, label all of the other forces acting on the objects.