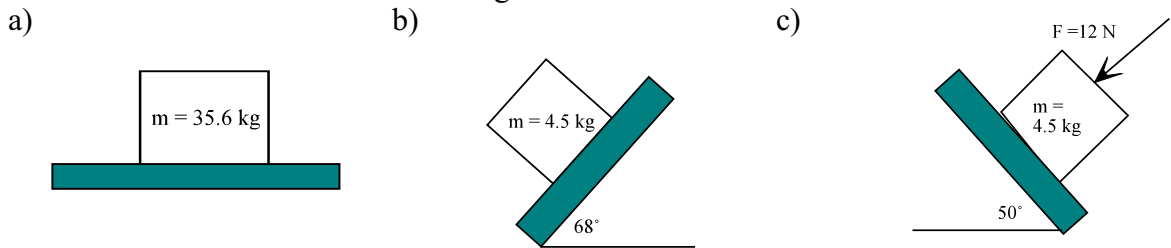
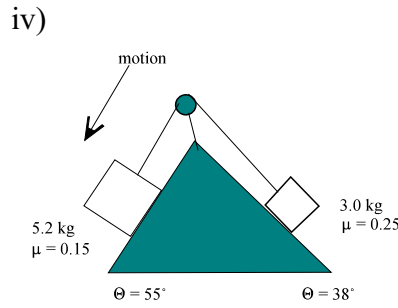
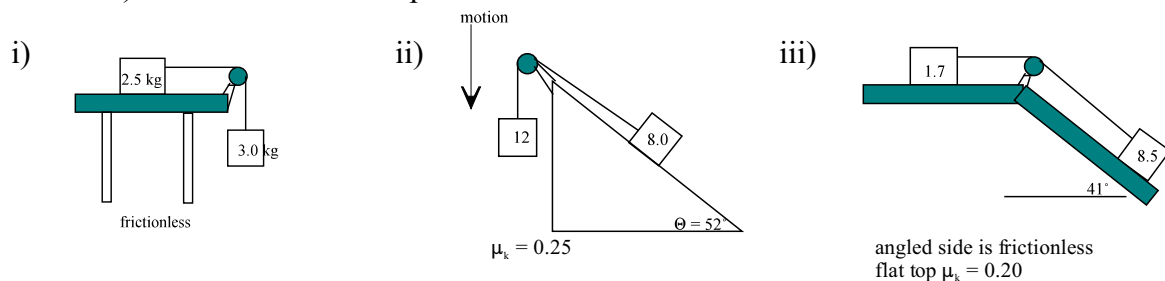


- Calculate the normal force in each of the situations below.
  - A 25.0 kg block in a stationary elevator.
  - A 25.0 kg block in an elevator accelerating up at 1.2 m/s/s.
  - A 25.0 kg block in an elevator accelerating down at 1.2 m/s/s.

- Calculate the normal force in each diagram.



- For each of the diagrams in #2, calculate the frictional force if  $\mu_k = 0.27$
- A rock slides from rest down a 13.5 m long ramp into a pool of water. If the ramp is inclined at an angle of  $55^\circ$  above the horizontal and the coefficient of kinetic friction between the rock and the ramp is 0.35, how long does it take the rock to hit the water?
- A box is pushed up a ramp with an initial velocity of 22.0 m/s. If the ramp is inclined at an angle of  $35^\circ$  above the horizontal and the coefficient of kinetic friction between the box and the ramp is 0.15, how far up the ramp will the box travel before stopping?
- For each of the following diagrams calculate:
  - acceleration of the system
  - tension in the rope.



Answers:

1a	245 N	3c	10.9 N
1b	275 N	4	$t = 2.04 \text{ s}$
1c	215 N	5	$d = 35.4 \text{ m}$
2a	349 N	6 (i)	$a = 5.35 \text{ m.s}^2, T = 13.4 \text{ N}$
2b	16.5 N	6 (ii)	$a = 2.19 \text{ m.s}^2, T = 91.3 \text{ N}$
2c	40.3 N	6 (iii)	$a = 5.03 \text{ m.s}^2, T = 11.9 \text{ N}$
3a	94.2 N	6 (iv)	$a = 1.64 \text{ m.s}^2, T = 28.8 \text{ N}$
3b	4.46 N		