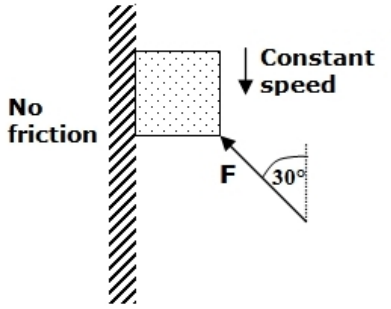
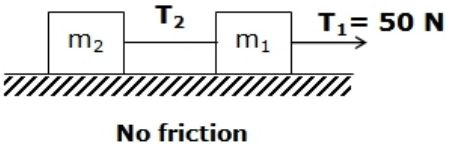
EXAM 1 – 041

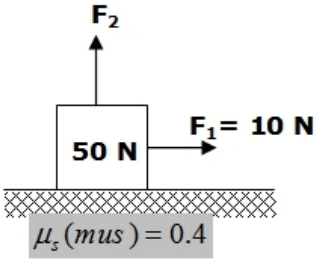
Q14Q0 A 2.0 kg box slides down a frictionless vertical
Q0 wall while you push on it with a force F at a 30 degrees
Q0 angle with the vertical (see **Fig 3**). What is the magnitude
Q0 of the normal force of the wall on the box if it is to
Q0 slide down at a constant speed?



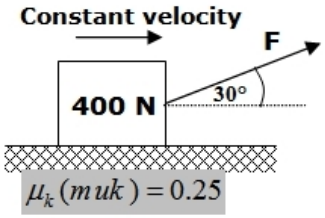
Q0
A1 11.3 N
A2 5.67 N
A3 15.6 N
A4 2.56 N
A5 zero N
Q0
Q15Q0 The weight of an astronaut on Earth is 800 N. What is
Q0 his weight on planet Mars, where g = 3.76 m/s**2?
Q0
A1 307 N
A2 213 N
A3 930 N
A4 135 N
A5 800 N
Q0
Q16Q0 A 20.0 kg block is resting on a frictionless horizontal
Q0 table. A horizontal string pulls the block. If the
Q0 tension in the string is 20.0 N, what is the speed
Q0 of the block after moving 2.0 m?
Q0
A1 2.0 m/s
A2 4.0 m/s
A3 1.0 m/s
A4 3.0 m/s
A5 5.0 m/s
Q0
Q17Q0 Two masses m1 (= 2.0 kg) and m2 (= 3.0 kg) are
Q0 connected as shown in **Fig 4**. Find the tension T2
Q0 if the tension T1 = 50.0 N.



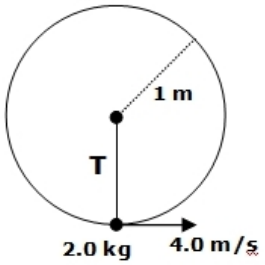
Q0
A1 30.0 N
A2 50.0 N
A3 20.0 N
A4 10.0 N
A5 zero
Q0
Q18Q0 A box with a weight of 50 N rests on a rough horizontal
Q0 surface (mus = 0.4). Two forces F1 (=10 N) and F2 act on the
Q0 box as shown in **Fig 5**. What is the smallest vertical force
Q0 F2 for which the box just starts sliding horizontally?



Q0
A1 25 N
A2 10 N
A3 14 N
A4 5.0 N
A5 35 N
Q0
Q19Q0 A 400-N block is pushed along a rough horizontal surface
Q0 (muk = 0.25) by an applied force F as shown in **Fig 6**. The
Q0 block moves at constant velocity. The magnitude of F is :
Q0



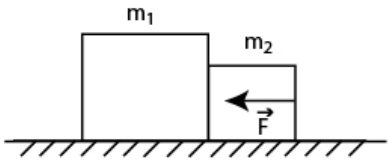
A1 101 N
A2 152 N
A3 83 N
A4 294 N
A5 405 N
Q0
Q20Q0 One end of a 1.0-m long string is fixed, the other end is
Q0 attached to a 2.0-kg stone. The stone swings in a vertical
Q0 circle, passing the lowest point at 4.0 m/s (see **Fig 7**).
Q0 The tension force (T) of the string at this point is:



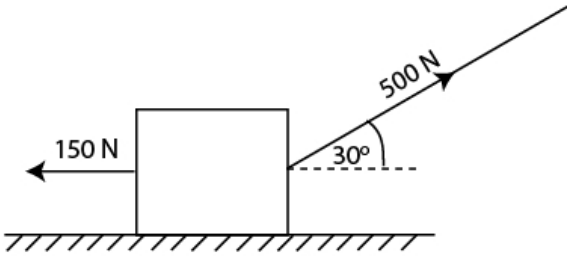
Q0
A1 52 N
A2 12 N
A3 20 N
A4 32 N
A5 0 N

EXAM 1 – 042

Q14Q0 Two blocks are in contact on a frictionless table .
Q0 A horizontal force is applied to block (m2), as shown
Q0 in **Fig. 4**. If m1=3.0 kg, m2=2.0 kg, and F=5.0 N, find the
Q0 magnitude of the force between the two blocks.
Q0

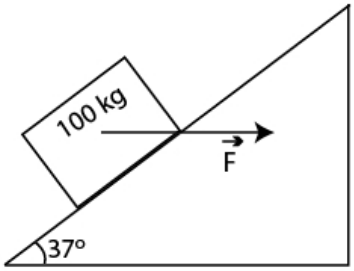


A1 3.0 N
A2 2.0 N
A3 4.0 N
A4 5.0 N
A5 4.7 N
Q0
Q15Q0 A worker drags a crate across a factory floor by pulling on
Q0 a rope tied to the crate as shown in **Fig.5**. The worker exerts
Q0 a force of 500 N on the rope, which is inclined at 30 degrees
Q0 to the horizontal, and the floor exerts a frictional force of
Q0 150 N. Calculate the magnitude of the acceleration of the crate
Q0 if its weight is 310 N.
Q0



A1 8.9 m/s**2
A2 6.0 m/s**2
A3 7.0 m/s**2
A4 2.0 m/s**2
A5 12 m/s**2
Q0

Q16Q0 In **Fig. 6** a 100 kg block is pushed at a constant speed up
Q0 the rough 37 degrees ramp by a horizontal force F.
Q0 The coefficient of kinetic friction between block and
Q0 surface is 0.15. What is the magnitude of force F?
Q0



A1 998 N
A2 660 N
A3 450 N
A4 570 N
A5 1850 N
Q0

Q17Q0 A block (m1= 3.0 kg) on a rough horizontal plane is connected
Q0 to a second block (m2=5.0 kg) by a cord over a massless pulley.
Q0 Calculate the coefficient of kinetic friction between the
Q0 block m1 and the table if the acceleration of the descending
Q0 block m2 is 4.3 m/s**2 (see **Fig 7**).
Q0

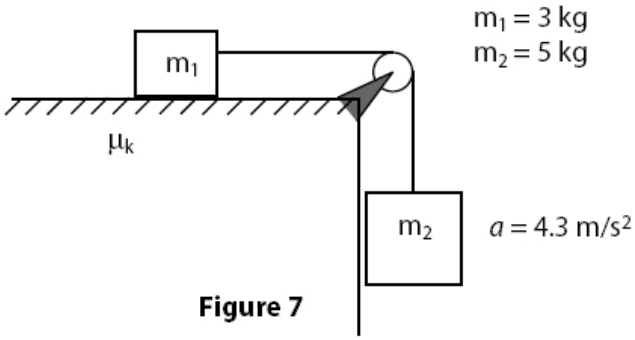


Figure 7

A1 0.50
A2 0.25
A3 0.35
A4 0.75
A5 0.65
Q0

Q18Q0 A car is rounding a flat curve of radius R=220 m with speed v
Q0 = 94 km/h. What is the magnitude of the force exerted by the
Q0 seat on the passenger whose mass m is 85 kg.

Q0
A1 263 N
A2 325 N
A3 455 N
A4 650 N
A5 100 N
Q0
Q19Q0 An object moving in a circle at constant speed:
Q0
A1 has an acceleration of constant magnitude.
A2 has a constant acceleration.
A3 has a constant velocity .
A4 is held to its path by centrifugal force (a force directed
A4 away from the center).
A5 has an acceleration that is tangent to the circle.
Q0
Q20Q0 Acceleration is always in the direction:
Q0
A1 of the net force .
A2 of the initial velocity .
A3 of the final velocity.
A4 of the displacement.
A5 opposite to the frictional force.