

Suggested problems Chapter 05

The quiz questions will be same or very similar to the following text-book problems.

Refer to the course website for the latest version of this document.

You are encouraged to seek the help of your instructor during his office hours.

13. Figure 5-33 shows an arrangement in which four disks are suspended by cords. The longer, top cord loops over a frictionless pulley and pulls with a force of magnitude 98 N on the wall to which it is attached. The tensions in the three shorter cords are $T_1 = 58.8$ N, $T_2 = 49.0$ N, and $T_3 = 9.8$ N. What are the masses of (a) disk A, (b) disk B, (c) disk C, and (d) disk D?

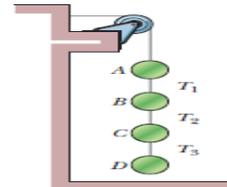


Fig. 5-33
Problem 13.

Answer: (a) 4.0 kg; (b) 1.0 kg ; (c) 4.0 kg; (d) 1.0 kg

34. In Fig. 5-40, a crate of mass $m = 100$ kg is pushed at constant speed up a frictionless ramp (30.0°) by a horizontal force \vec{F} . What are the magnitudes of (a) \vec{F} and (b) the force on the crate from the ramp?

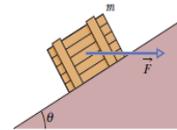


Fig. 5-40 Problem 34.

Answer: (a) 651 N; (b) 1300 N

51. Figure 5-47 shows two blocks connected by a cord (of negligible mass) that passes over a frictionless pulley (also of negligible mass). The arrangement is known as Atwood's machine. One block has mass $m_1 = 1.30$ kg; the other has mass $m_2 = 2.80$ kg. What are (a) the magnitude of the blocks' acceleration and (b) the tension in the cord?

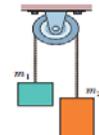


Fig. 5-47
Problems 51
and 65.

Answer: (a) 3.6 m/s^2 ; (b) 17 N

56. In Fig. 5-51a, a constant horizontal force \vec{F}_a is applied to block A, which pushes against block B with a 20.0 N force directed horizontally to the right. In Fig. 5-51b, the same force \vec{F}_a is applied to block B; now block A pushes on block B with a 10.0 N force directed horizontally to the left. The blocks have a combined mass of 12.0 kg. What are the magnitudes of (a) their acceleration in Fig. 5-51a and (b) force \vec{F}_a ?

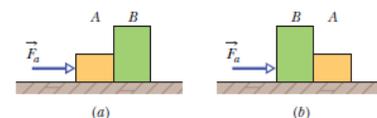


Fig. 5-51 Problem 56.

Answer: (a) 2.08 m/s^2 ; (b) 25.0 N

67. Figure 5-58 shows three blocks attached by cords that loop over frictionless pulleys. Block B lies on a frictionless table; the masses are $m_A = 6.00$ kg, $m_B = 8.00$ kg, and $m_C = 10.0$ kg. When the blocks are released, what is the tension in the cord at the right?

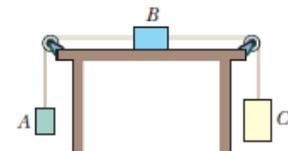


Fig. 5-58 Problem 67.

Answer: 81.7 N