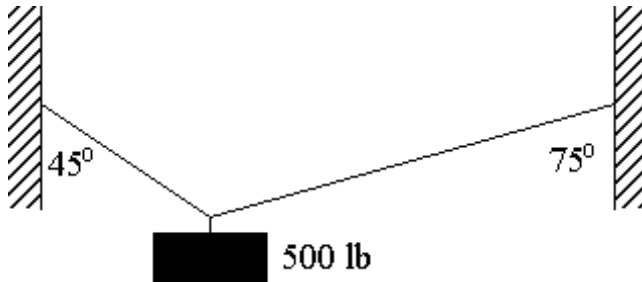First Name_____ Last Name _____

# Lab 2

Solve the problem.

1) Two cables support a 500-lb weight, as shown. Find the tension in each cable. Round to the nearest tenth of a pound.


    A) Left cable tension = 557.7 lb; right cable tension = 408.2 lb
    B) Left cable tension = 250.0 lb; right cable tension = 355.5 lb
    C) Left cable tension = 408.2 lb; right cable tension = 557.7 lb
    D) Left cable tension = 250.0 lb; right cable tension = 250.0 lb

2) A 450-lb sign is hanging from the end of a hinged boom, supported by a cable inclined at 38° with the horizontal. Find the tension in the cable and the compression in the boom rounded to the nearest pound.
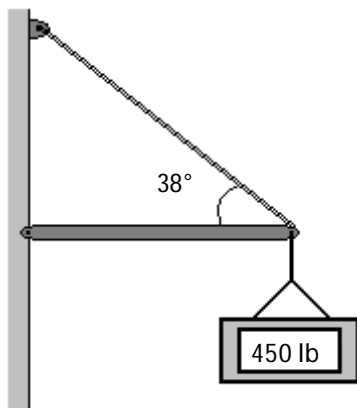
    A) Cable: 352-lb tension; boom: 571-lb compression
    B) Cable: 571-lb tension; boom: 352-lb compression
    C) Cable: 731-lb tension; boom 576-lb compression
    D) Cable: 576-lb tension; boom: 731-lb compression

Solve the problem.

3) At a state fair truck pull, two pickup trucks are attached to the back end of a monster truck as illustrated in the figure. One of the pickups pulls with a force of 1800 pounds and the other pulls with a force of 3600 pounds with an angle of 45° between them. With how much force must the monster truck pull in order to remain unmoved? HINT: Place one of the pickup's force vectors on the positive x-axis. Round your answer to the nearest tenth.

1800 lb

45°

3600 lb
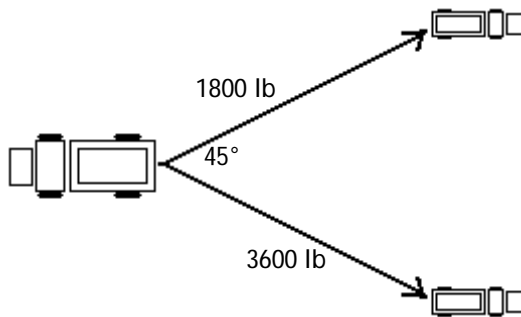
A) The truck must pull with a force of 1948.3 lb.   B) The truck must pull with a force of 4703.6 lb.

C) The truck must pull with a force of 2652.5 lb.   D) The truck must pull with a force of 5036.3 lb.

4) A force of magnitude 8 pounds pulling on a suitcase makes an angle of 30° with the ground. Express the force in terms of its i and j components.

A) 6.928i + 4.000 j   B) 0.8660i + + 0.5000j   C) 4.000i + 6.928j   D) 1.234i - 7.904j

5) A child throws a ball with a speed of 5 feet per second at an angle of 56° with the horizontal. Express the vector described in terms of i and j. If exact values are not possible, round components to 3 decimals.

A) 2.796i + 4.145j   B) -2.796i + 4.145j   C) 4.145i + 2.796j   D) 4.145i - 2.796j

6) An airplane is flying in the direction 50° west of north at 817 km/hr. Find the component form of the velocity of the airplane, assuming that the positive x-axis represents due east and the positive y-axis represents due north.

A) $\langle -625.9, 525.2 \rangle$ B) $\langle -0.7660, 0.6428 \rangle$ C) $\langle 214.4, 788.4 \rangle$ D) $\langle -525.2, 625.9 \rangle$

7) A wind has an easterly component of 5 km/h and a northerly component of 14 km/h. Find the direction of the wind.

A) E 19.7° N   B) E 19.2° N   C) E 70.3° N   D) E 53.7° N

8) Suppose you would like to cross a 201-foot wide river in a boat. Assume that the boat can travel 31 mph relative to the water and that the current is flowing west at the rate of 6 mph. What bearing should be chosen so that the boat will land at a point exactly across from its starting point? Give your answer to the nearest tenth of a degree.

A) E 8.9° N   B) E 78.8° N   C) E 11.2° N   D) E 7.4° N

1) A
2) C
3) D
4) A
5) A
6) A
7) C
8) C