

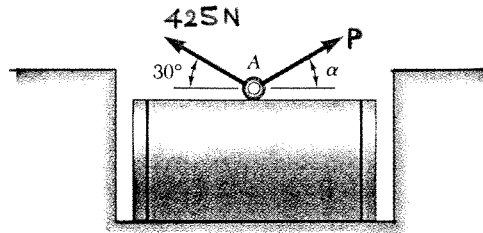
CIV100 – MECHANICS – SECTION 5

Assignment No. 1 – Thursday, September 12, 2013

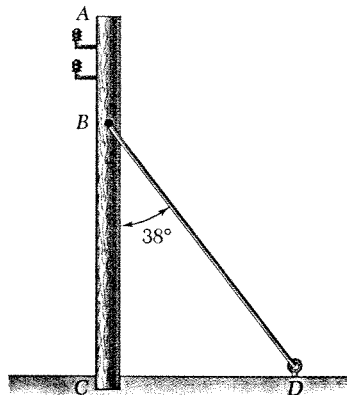
Due: 11:10 a.m., Tuesday, September 17, 2013, stapled and on correct “engineering paper”.

Topic: Resultants and Components in 2D and 3D (Textbook Chapters 1 & 2)

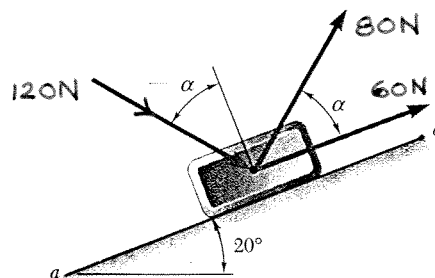
1. A steel tank is to be positioned in an excavation. Knowing that $\alpha = 20^\circ$, determine by trigonometry:
- (a) The required magnitude of the force \vec{P} if the resultant \vec{R} of the two forces applied at A is to be vertical;
 - (b) The corresponding magnitude of \vec{R} .



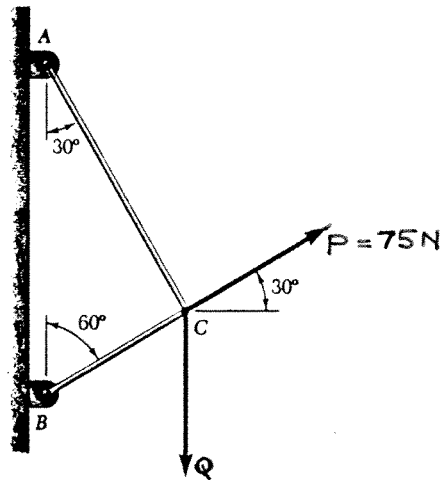
2. The guy wire BD exerts on the telephone pole AC a force \vec{P} directed along BD. Knowing that \vec{P} must have a 120N component perpendicular to the pole AC, determine:
- (a) The magnitude of the force \vec{P} ;
 - (b) Its component along line AC.



3. For the given block on the inclined plane determine:
- (a) The required value of α , if the resultant of the three forces shown is to be parallel to the incline;
 - (b) The corresponding magnitude of the resultant.



4. Two cables tied together at C are loaded as shown. Determine the range of values of Q for which the tension will not exceed 60N in either cable.



5. A frame ABC is supported in part by cable DBE which passes through a frictionless ring at B. Knowing that the tension in the cable is 385N, determine:

- The components of the force exerted by the cable on the support at D;
- The components of the force exerted by the cable on the support at E.

