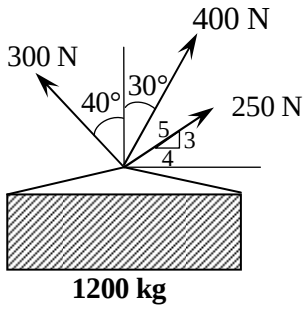
UNIVERSITY OF TORONTO
Department of Civil Engineering

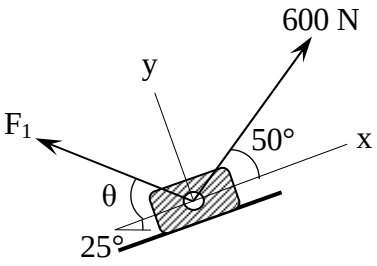
CIV100F - MECHANICS – GROUP G (107)
Problem Set 1
Due: 4:00 pm on September 14, 2012

1. A weight block is subjected to the forces shown. Determine the resultant force, using

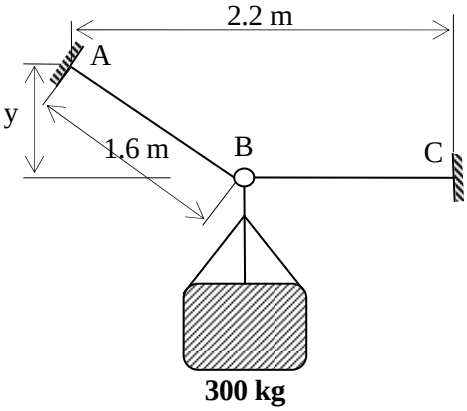
i) the parallelogram rule,
ii) the polygon rule (using trigonometry),
iii) the rectangular components method, and
iv) the polygon rule (using a scaled drawing).



2. A steel bracket is subjected to the forces shown. In order for the resultant force to be directed along the positive y axis, determine the magnitude and direction (i.e., θ) of F_1 if F_1 is to be a minimum.



3. If cable AB can withstand a maximum force of 4000 N, determine the maximum force in cable BC and the distance *y* so that 300-kg crate can be supported.



4. A gusset plate is subjected to the forces shown. Determine the force F_1 and the angle θ for equilibrium.