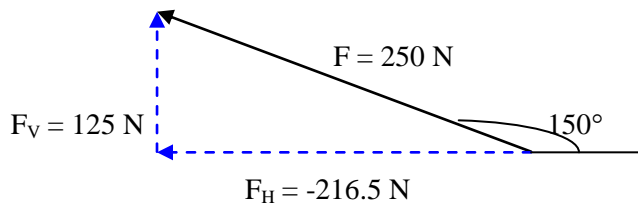


## Assignment MathCAD 4

1. Write a program that receives a vector of scores through the parameter list, then uses *mean()* function to compute the average score.
2. Write a program that receives a numerical grade, then use if statement to determine the grade is pass or fail, and return the string “pass” or “fail”
  - Grade  $\geq 50$  is “pass”
  - Grade is “fail” otherwise
3. Write a MathCAD program to calculate *the factorial of n* i.e.  $n!$ 
  - $n! = (1)(2)(3)(4) \dots (n)$

4.



The formula for the vertical ( $F_V$ ) and horizontal ( $F_H$ ) components of a force ( $F = 250 \text{ N}$ ) acting at  $150^\circ$  are  $F_V = F \sin\theta = 250 \text{ N} \sin(150) = 125 \text{ N}$  and  $F_H = F \cos\theta = 250 \text{ N} \cos(150) = -216.5 \text{ N}$ .

- (a) Write a Mathcad program that receives the magnitude and direction (angle) of a force and returns both horizontal and vertical components. Remember *cos* and *sin* function take angles in radian. So need to convert the angle from degrees to radian inside your program.
- (b) Test your program using the force 250N acting at  $150^\circ$
- (c) Use your program to determine the horizontal and vertical components of the following forces:
  - (i) 250 N at  $60^\circ$
  - (ii) 1200N at  $220^\circ$
  - (iii) 840  $\text{lb}_f$  at  $45^\circ$