Name:	Sunday, October 02, 2011

Ku:	/28	Mc:	/	Inq:	/	Com:	

Use GRFS and use highly detailed diagrams.

1. Mr. LoRusso's GPS one day decided to declare that it was "National Indirect Route Day". In celebration of the event Magellan decided that the following route would be optimal. Leg A: $40km\left[N32^0W\right]$, Leg B: $18km\left[S35^0E\right]$, Leg C: $72km\left[W60^0S\right]$. Find Mr. LoRusso's displacement. **[ku:8]**

2. A jet has a maximum airspeed of 800km/h and is flying through a wind that is moving at a rate of $90km/h$ in the direction of $\left[W30^0S\right]$. Determine **[ku: 8]**

   a) the correct heading of the jet if the pilot wishes to maintain a bearing of due north
   b) the ground speed of the plane in part a)

3. A fighter jet flying at rate of 1400 km/h needs to hit a target that is directly **north** of the plane's current position. The missile has a maximum speed of 2500 km/h [w.r.t the jet]. The plane currently has a heading that is due **east**. If the wind is coming **_from_** a direction of $\left[E30^0 S \right]$ at a rate of 175 km/h. Determine: **[ku: 12]**

    a) The missile's ground speed (clue: write the vector equation for the relative motion and make a fancy-pants chart for your vectors)

    b) The angle from which the missile should be fired from the plane (ok ok... yes military experts... I know fighter jets don't have their missiles on turrets... pretend it's Star Wars and all will be fine)

    c) The time it takes to "neutralize the threat" (that's what we call a euphemism) if the threat is located 10 km away directly north of the position of the plane when the missile was fired. .