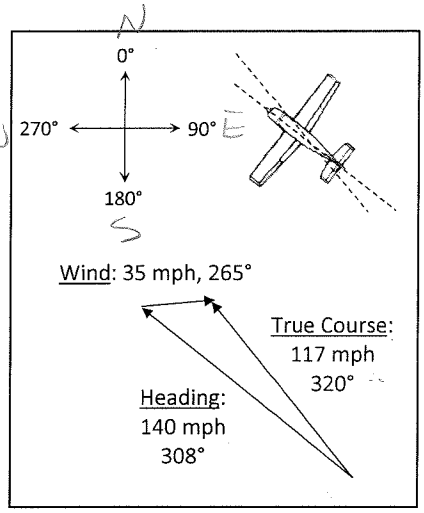
Name: _____ Hr: _____

How Do We Get There From Here?

Objectives: Complete the example below together as a class. Determine the ground speed, wind correction angle, corrected course heading, and flight time. In addition, determine if the wind is a tailwind, headwind, or crosswind. Draw a vector diagram representing each scenario.

A pilot must know how the wind will affect a flight and how to make a corrected course heading. The basic concept, treated like a vector addition problem, is shown in the box to the right.



The Slide Flight Computer allows a pilot to quickly determine course corrections by doing a vector calculation. By entering the air speed of the plane and the speed and direction of the wind, the corrected course heading and ground speed of the plane are calculated.

In this exercise, you will see how wind affects the flight and how manipulation of vectors helps a pilot make a flight plan and arrive at the right place as efficiently as possible.

Example – Flight Plan from Stevens Point to Superior

air speed of plane: 140 mph *true course heading: 320°* *wind: from the west, 265°, 35 mph*

Steps to Determine Ground Speed & Wind Correction Angle	Input	Output
1. Rotate inner ring until wind direction is under the true index arrowhead.	265°	
2. Set the center dot on one of the darker circles.	Use the 100 line	
3. Use the wind speed to determine where, above the center dot, a small, light pencil dot on the plastic screen should be placed.	Use 135	
4. Rotate the ring until the true course heading is under the true index arrowhead.	320°	
5. Move the slide card until the dot you drew is on the true air speed line.	140	
6. The ground speed is under the center dot. Use this to calculate flight time.		117
7. The wind correction angle is marked by the pencil dot.		-12°
8. Erase the lightly drawn pencil dot.		

- is left
+ is right

In this example, the pilot will subtract 12° from the true course heading of 320°, for a corrected course heading of 308°. Because the plane will have a general headwind, the ground speed is reduced from 140 mph to 117 mph. The ground speed is used to calculate arrival time and the amount of fuel needed. Since our trip is 250 miles from Stevens Point to Superior, the time is calculated to be 250 miles / 117 mph, or 2.15 hours. Flight plans are submitted to the FAA. If the plane does not arrive within the allotted time, the FAA will begin to search for the plane!

$v = \frac{d}{t} \rightarrow t = \frac{d}{v}$

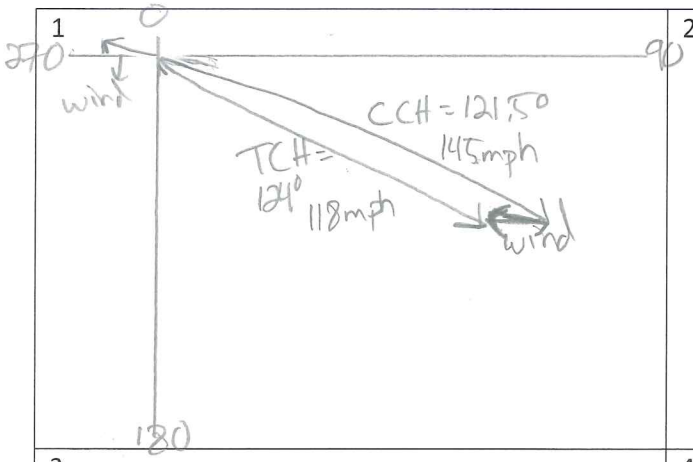
headwind → slow down
tail wind → speed up
cross wind → no speed change

Complete problems 1-4 using the slide computer. Fill in the chart to show the flight plans.

	1	2	3	4
True Course	124°	295°	37°	216°
Distance	427 miles	375 miles	298 miles	338 miles
Wind Speed	28 mph	32 mph	47 mph	24 mph
Wind Direction	112°	195°	210°	312°
Air Speed	145 mph	210 mph	175 mph	160 mph
Ground Speed	118 mph	213 mph	221 mph	160 mph
Wind Correction Angle	-2.5°	-8.5°	+3°	+8.5°
Corrected Course Heading	121.5°	286.5°	40°	224.5°
Flight Time				
Head-/tail-/cross-wind				

(CCH, Air) + (WD, wind) = (TCH, ground)

Draw a vector sketch showing the heading with air speed and angle, the wind with wind speed and direction, & the resultant with ground speed and angle. Use the example sketch as a guide.

1 	2
3	4