2-6-1	10/3/22	Isaac Abella

P: What angle must the boat head in deg?

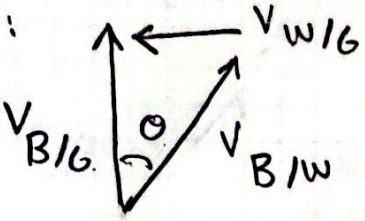
O: Boat speed in still water: 2 m/s, travels noth 108 m

river velocity = .95 m/s ←

$V_{B/G}$, $V_{W/G}$, $V_{B/W}$

$V = \frac{\Delta \text{ distance}}{\Delta \text{ time}}$.

R:



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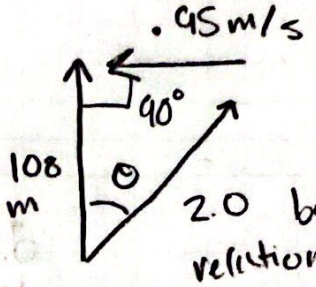


Solution: A

$$\frac{\sin 90}{V_{B/W}} = \frac{\sin \theta}{V_{W/G}} \qquad \frac{\sin 90}{2.0} = \frac{\sin \theta}{.95} = \boxed{28.3 \text{ deg}}$$

P: How long will it take for the boat to get across the river

Solution B.

solve for velocity of $V_{B/g}$ given $V_{W/g}$ and $V_{B/W}$

$$X^2 + .95^2 = 2.0^2$$

$X = 1.75$ m/s

108m/1.75 m/s

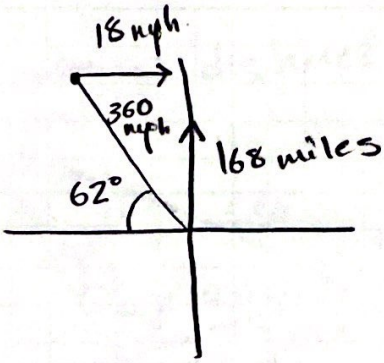
$\boxed{= 61.75}$

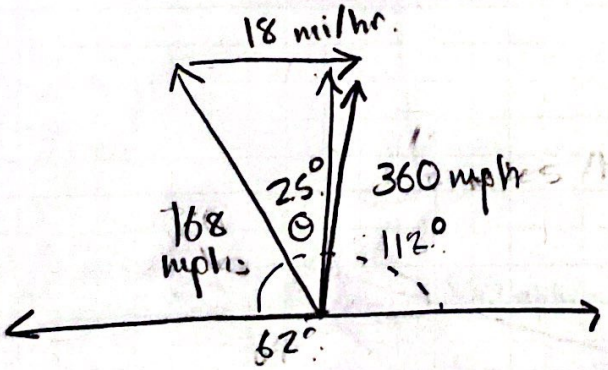
2-6-1	10/3/22	Isaac Abella.

Problem A: What direction does the airplane need to fly to reach Terre Haute?

Given: 360 miles @ 62° NoW from Knoxville, airspeed is 168 mph, wind blows 18 mph east

Represent:





$V_{P/A} = 168$ mi/hr

$V_{G/A}$

$V_{A/G} = 18$ mi/hr.

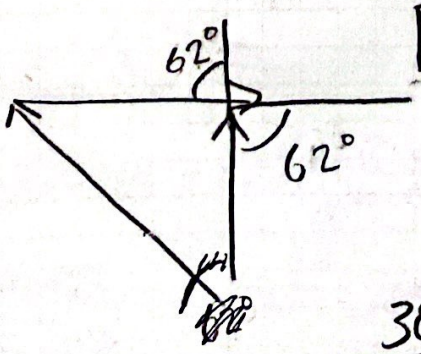
$180 - 62 = 118$

$180 - (25\text{deg} + 118)$

$= 25$ deg

$\frac{\sin 112}{360} = \frac{\sin\theta}{18\text{ mph}}$

$= 56.3°$ N of W



$\frac{\sin 118}{168} = \frac{\sin 56.3}{\text{Velocity}} = 158.3$ mph.

$\frac{360}{158.3} =$ 2.27 hrs

2-6-3	10/3/22	Isaac Abella.

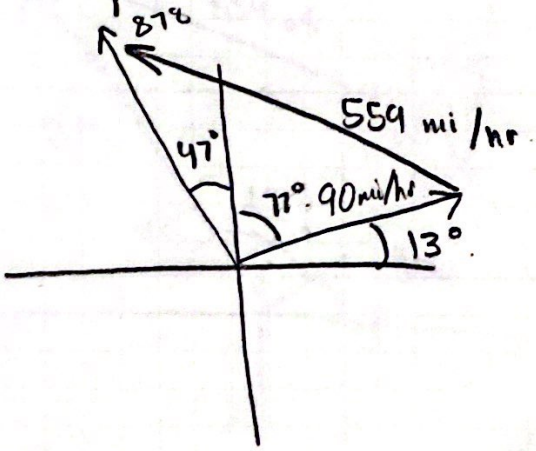
P: direction the plane should fly straight from Barnesburg to Harpertown.

G: $V_{P/A} = 559$ mi/hr

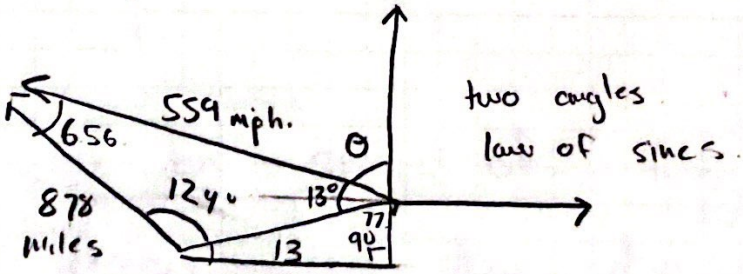
$V_{A/G} = 90$ mi/hr @ 13° NoE.

Harpertown distance = 878 miles 47° wofN.

R:



Solution:



two angles
law of sines.

$$\frac{\sin 124}{559} = \frac{\sin \theta}{90}$$

$180 - 124 - 7.67 = 48.33$ interior angle $= 6.56° = \theta$

$48.33 - 13.00 = 35.33$

$90 - 35.33 = \boxed{54.67 \text{ deg}}$

2-6-3	10/4/22	Isaac Abella

Q:) What is your time to travel?

O:) $V_{P/A} = 559$ mi

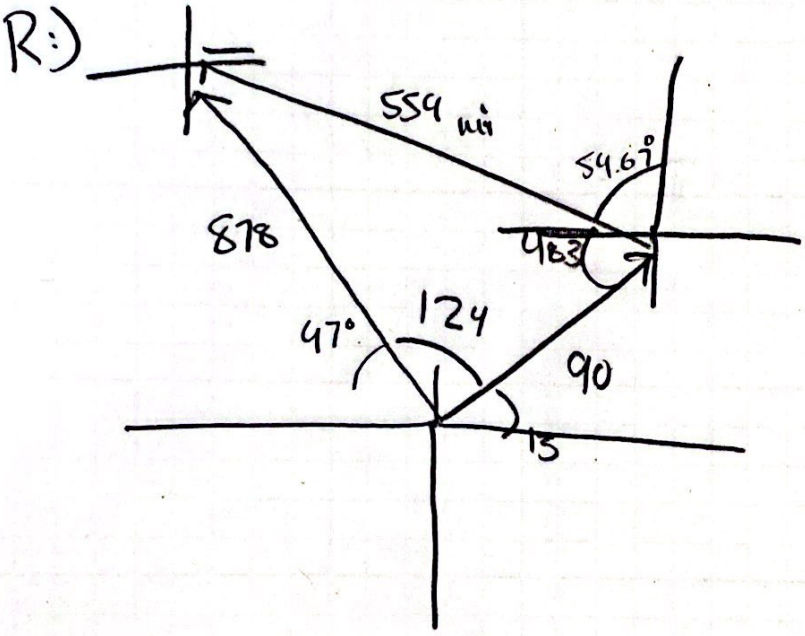
destination = 878 miles

47°

$V_{A/G} = 90$ mi/hr @ 13°

$t = \frac{d}{s}$

R:)



Solution solve for speed of $V_{P/A}$ given our interior angle then divide 878 by that speed.

law of sines = $\frac{\sin 48.33}{X} = \frac{\sin 124}{559} = 503.6$ mi/hr

$\frac{878 \text{ mi}}{503.6 \text{ mi/hr}} = 1.74$ hrs