PRE-AP PRE-CALCULUS—WORKSHEET BEARINGS—NAME: Key

1. An airplane leaves Boston with a bearing of 240° towards Atlanta and the distance is approximately 936 miles. Once the plane arrives at Atlanta, the next trip is on a bearing of 320° to Chicago and the distance is approximately 589 miles. Once at Chicago, the plane returns to Boston at the end of the day.
   a) Draw a diagram to represent the path of the plane. (hint: Chicago is south of Boston)
   b) Determine the distance from Chicago back to Boston. (Answer: 1189.32 miles)
   c) Determine the bearing the plane must take in order to return to Boston from Chicago. (A: 89.19°)

2. A forest ranger at lookout Zulu spots a flare on a bearing of N 35° E and at a distance of 3 miles. A rescue party is currently on a bearing of N 50° W from the lookout. The rescue party saw the flare as well at a bearing of S 80° E.
   a) Draw a diagram that shows the relationship of the three parties involved.
   b) Determine the distance from the rescue party to the person who shot the flare and the distance from lookout Zulu. (A: 5.98 miles and 5.44 miles, respectively)

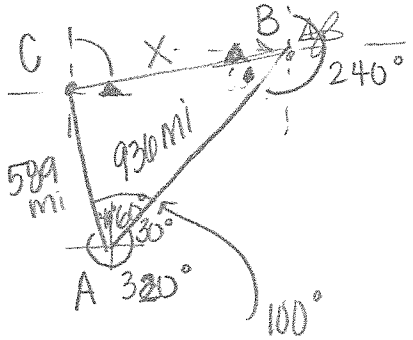
3. A land surveyor is mapping a triangular parcel of land. The surveyor starts by facing due north from point A and walks for 600 feet to point B. The surveyor then turns left at some angle and walks for 315 feet to point C. Then the surveyor turns left one more time and walks for 401 feet back to point A.
   a) Draw a diagram to represent the surveyor's path.
   b) Determine the bearing the surveyor took from point B to point C. (A: 217.86°)
   c) Determine the bearing from point C to point A. (A: 151.17°)

4. Captain πRate (the rare Greek pirate) was navigating the Caribbean way back in the mid 17th century. He left dock at the southern tip of Greece to bury part of his treasure in the north part of Africa. He first left Greece with a bearing of 200° for approximately 900 miles. Then he went some bearing east towards modern day Israel for about 1620 miles and eventually returned to Greece which is approximately1150 miles from Israel.
   a) Draw a diagram to represent the situation.
   b) Determine the following bearings:
      i. From Greece to Israel (A: 96.25°)
      ii. From Israel to Africa (A: 243.59°)
      iii. From Africa to Greece (A: 20°)
      iv. From Africa to Israel (A: 63.59°)

5. Rusty Yaht sets sail from his personal dock at 8:00 am on a bearing of 65°. After sailing 5 km, he changes course and sails 10 km on a bearing of 120°. How far away from his personal dock is he at the end of the 15 km voyage? (A: 13.50 km)

6. Dawn Indy-Valley sailed her scow 12 miles from Port A on a bearing of 125°. Then she changed her course and sailed 8 miles to buoy marker B on a bearing of 340°. How far is buoy marker B from Port A? (A: 7.12 miles)

1. a.



b. $x^2 = 930^2 + 589^2 - 2(930)(589)\cos 100$

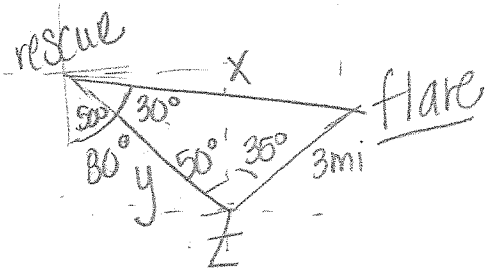
$x = 1189.320$ mi

c. $\frac{\sin 100°}{1189.32} = \frac{\sin B}{589}$ $B = 29.191°$

$270° - 29.191° - 240° = .809°$

bearing: $90° - .809° \rightarrow 89.191°$

2. a.



b. $\frac{\sin 30°}{3} = \frac{\sin 85°}{x}$

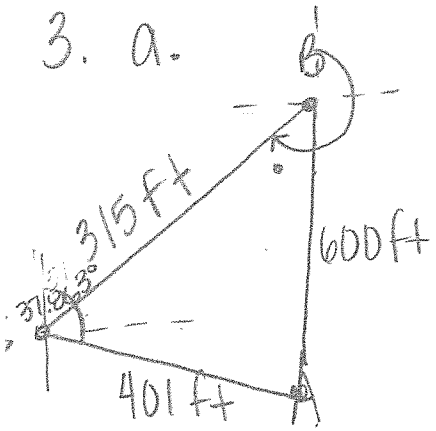
5.977 mi

$\angle flare = 65°$

$\frac{\sin 30°}{3} = \frac{\sin 65°}{y}$

5.438 mi

3. a.



b. $401^2 = 315^2 + 600^2 - 2(315)(600)\cos B$

$B = 37.863°$

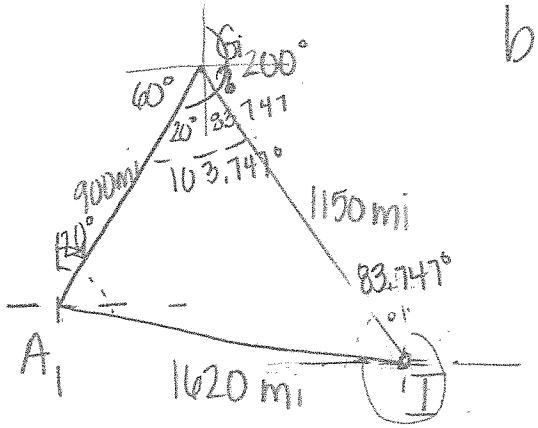
bearing $\rightarrow 180° + 37.863° =$ 217.863°

c. $600^2 = 401^2 + 315^2 - 2(401)(315)\cos C$

$C = 113.312°$

bearing $\rightarrow 37.863° + 113.312°$ 151.175°

4. a.



b. i $1620^2 = 900^2 + 1150^2 - 2(900)(1150)\cos G$

$G = 103.747°$

bearing $\rightarrow 180° - 83.747°$ 96.25

ii. $\frac{\sin 103.747°}{1620} = \frac{\sin I}{900}$ $I = 32.659$

$360° - 32.659° - 83.747° =$ 243.59

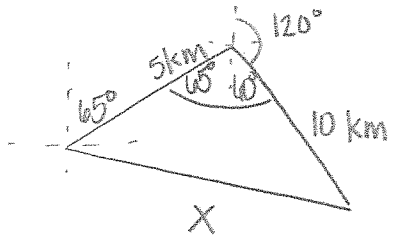
iii. 20°

iv. $180° - 103.747° - 32.659°$

$A = 43.594° + 20°$

bearing: AI 63.594°

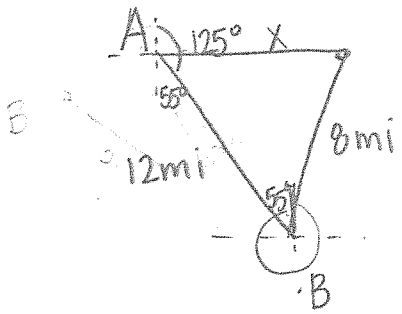
5.



$x^2 = 5^2 + 10^2 - 2(5)(10)\cos 125°$

x = 13.504 km

6.



$\angle B = 55° - 20° = 35°$

$x^2 = 12^2 + 8^2 - 2(12)(8)\cos 35°$

x = 7.122 mi