

Regents Earth Science
Isolines (Isobars) and Gradient

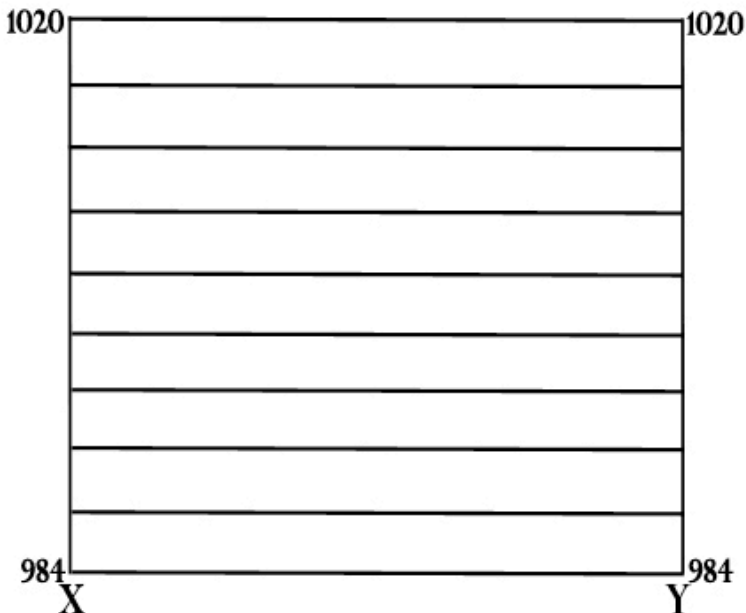
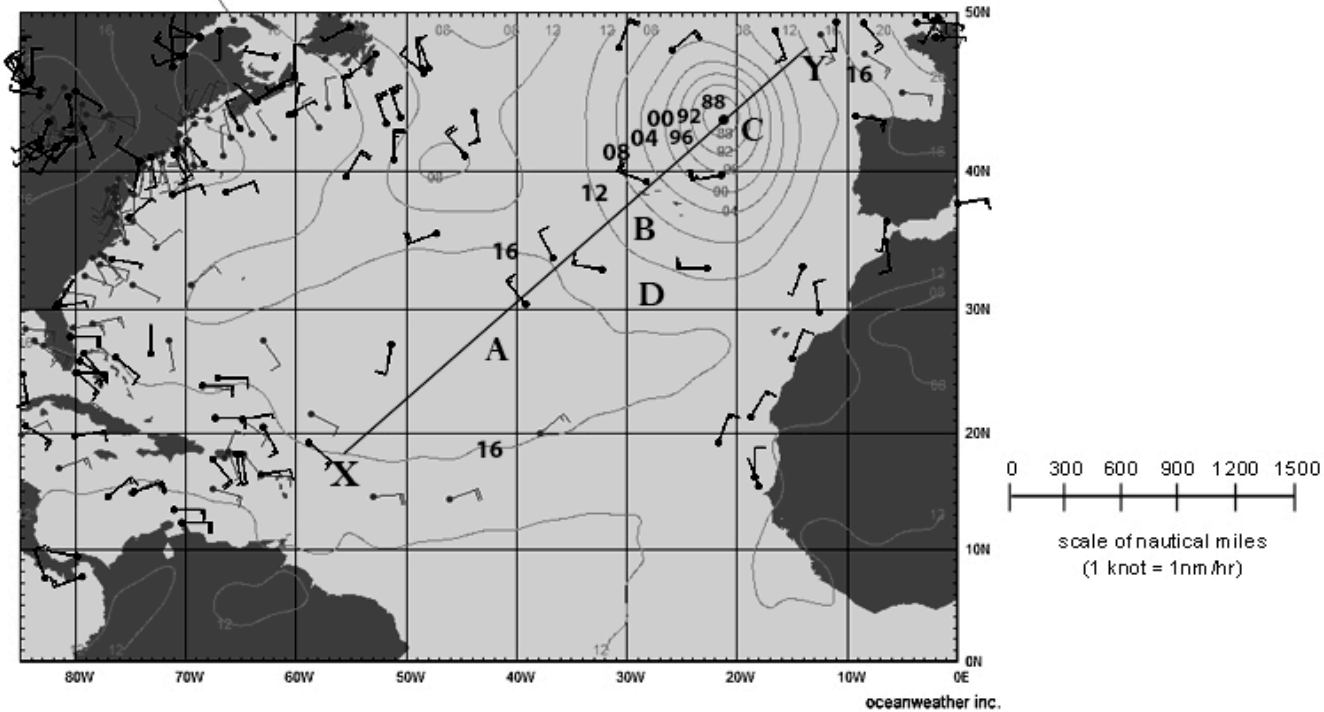
Created by Z. Miller 2015

Attached is a map from October 9, 2015 showing atmospheric pressure conditions in the Northern Atlantic Ocean. Note the low-pressure system, former Hurricane Joaquin, in the upper right portion of the map (just west of Europe). Joaquin is a post-tropical storm losing intensity at this point in its lifespan. According to a weather expert, Dr. Jeff Masters, at wunderground.com, the outlook for the persistent Joaquin as of Wednesday, October 7 was:

“By Wednesday night [October 7], Joaquin will evolve into a powerful extratropical storm, and will steadily weaken as it heads towards Europe. By the time Joaquin reaches Portugal on Saturday [October 10], the ex-hurricane should have top winds of about 40 mph.”
(This full blog post can be found here: <http://www.wunderground.com/blog/JeffMasters/comment.html?entrynum=3149>, and the complete tracking data for Joaquin can be found here: <http://weather.unisys.com/hurricane/atlantic/2015/JOAQUIN/track.dat>)

1. Draw an accurate pressure profile across the Northern Atlantic Ocean from point X to Point Y on the graph below. Be sure to label the y-axis of your graph appropriately.

Marine Observations Valid for October 09, 2015 06 GMT
Model Pressures Valid for October 09, 2015 06 GMT



2. What is the isobar/isoline interval? _____
3. What is the probable atmospheric air pressure at point B?

4. What is the probable atmospheric air pressure at point D?

5. Which of the locations – A, B, or C – would likely have the highest wind speed (Hint: Remember the concept of gradient)?

6. Explain your answer to Question #5 above:

7. Calculate the gradient between the eye of the storm (see the dot (•) along the profile of the map) and point Y:

Final Answer: _____