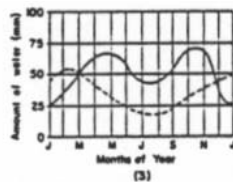


Climate Factors Review – ANSWERS

1. (3) **prevailing winds** – Just a fact: the prevailing (planetary) winds drag the surface ocean water creating the ocean currents.
2. (1) **These locations are on the leeward side of mountain ranges.** – The prevailing winds are coming across the mountains from the west to the east. This makes the western side the windward side of the mountains and the eastern side the leeward side. The leeward side of the mountains is where dry air sinks, compresses and warms creating rain-shadow deserts.
3. (2) **California Current** – Use the Surface Ocean Currents Map on the ESRT. The west coast of North America is influenced by a couple of ocean currents. But, the ocean current that cools the coast is called the California Current (cool currents are represented by hollow arrows).
4. (1) **Long Island** – Either you realize right away that a location with a small temperature range would be by the coast and just know Long Island is the answer. Or, you didn't realize it and you go to the ESRT New York State map to find all the locations and then realize Long Island is the only coastal area.
5. (1) **warmer summers and cooler winters** – The question is asking about inland areas. Inland areas have no large body of water nearby to moderate the temperatures. Therefore, inland locations have a hotter summer and colder winters.

6.



Graph (3) shows that for most of the year, the precipitation (solid line) is greater than evapotranspiration (dashed line). This would cause it to have the wettest climate.

7.



(4) Location D - If all locations are on the same latitude (as in the diagram), then the location closest to the coast would have the smallest temperature range because of the moderating effect of water.

8. (2) **Water loses heat more slowly than land.** – The whole reason why winters stay warmer near the coast is because water has a high specific heat. This means it retains heat longer (cools down slower).

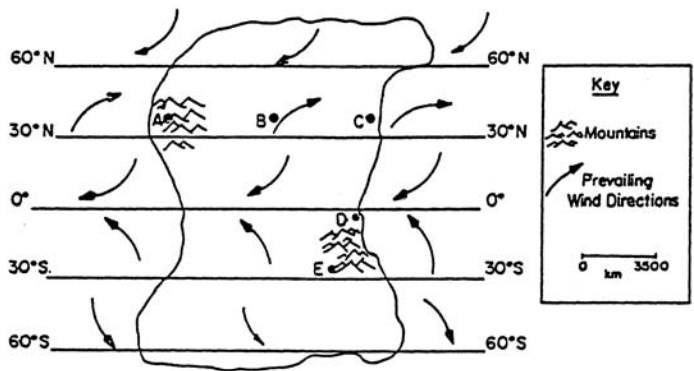
9. (3) **elevation** –

First, longitude is not a climate factor. Next, the chart shows that both locations are located at the same latitude – this means that the variation seen in temperature is **not** caused by the two locations being at different latitudes.

Also, if the locations are at the same latitude, they are experiencing the same amount of daylight hours (and # of daylight hours are not a climate factor either ...) Location B must be up in the mountains to have such a low annual average temperature – elevation is the only logical choice.

Location	Annual Average Temperature	Latitude	Longitude
A	12°C	44°15' N	75°00' W
B	-1°C	44°15' N	74°00' W

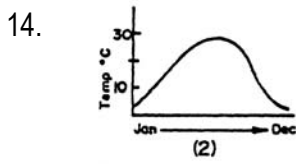
10. **(4) D**
 Evapotranspiration is influenced most by the temperature. As temperature increases, Ep increases. Since location D is nearest to the Equator, it would have the highest temperatures and therefore the greatest Ep.



11. **(1) arid**
 Location E is right near 30°S latitude (a dry belt caused by diverging planetary winds).
 Location E is also on the leeward side of a mountain range. The prevailing winds in that region come from the SE making the western side of these mountains, the leeward side and a rain-shadow desert.

12. **(2) total yearly rainfall than location B** – Since A is on the windward side of a mountain chain, the air on that side rises, expands, and cools to the dewpoint to form clouds. A would have a smaller temperature range than B (A is on the coast) – therefore choice 1 is incorrect. Since A and B are on the same latitude, they would both have similar angles of insolation and variation in daylight hours.

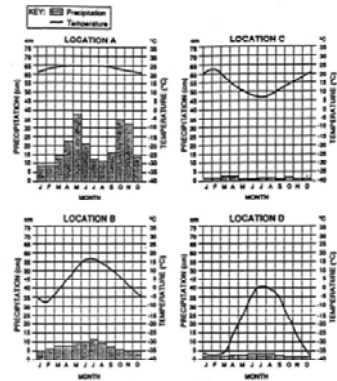
13. **(4) December** – Since location E is in the Southern Hemisphere, it experiences the opposite season that the Northern Hemisphere has. Since the greatest insolation is received by the Northern Hemisphere in June, the greatest insolation will be received by the Southern Hemisphere in December.



Location B is in the northern Hemisphere. This means choices 1 and 4 cannot be the answer because they represent temperatures in the Southern Hemisphere. Location B is also inland and a decent distance away from the Equator. This means it would have a larger range of temperatures – choice 2 illustrates this better than choice 3.

15. **(1) A** – Just read the bar graphs. Location A shows the greatest fluctuation in precipitation throughout the year.

16. **(1) A** – Ep (evapotranspiration) is most influenced by temperature. The higher the temperature, the greater the Ep. The temperature for July is greatest at Location A meaning the Ep for Location A is greatest.

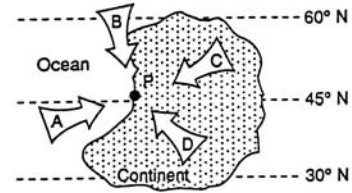


17. **(3) C** – Location C shows the temperature curve of a Southern Hemisphere location because the temperatures dip down during our summer months (June through August) because it is winter in the Southern Hemisphere.

18. **(4) D** – Location D shows low average monthly temperatures, a large temperature range, and low precipitation (a dry area). All these qualities are that of the North Pole.

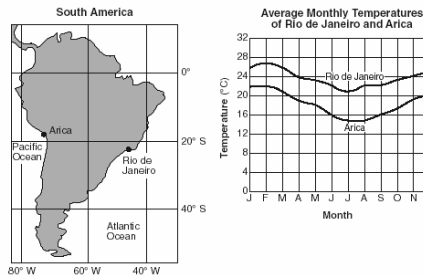
19. **(2) Location A is close to the Equator.** – The climograph for Location A is a typical graph for a place found on the Equator – Equatorial areas are warm all year round and has a small temperature range (temperatures don't vary that much).

20. (1) **A** – There are two ways to handle this question. First, you could just use the planetary wind belt chart in the ESRT to remind you that the winds between 30°N and 60°N are the SW winds (come from the SW). The only lettered wind that comes from the SW is labeled A.



The other way to handle the question is to realize that wind A is coming from the water which would bring moisture inland cause more precipitation.

21. (3) **warmer and drier** – B is on the leeward side of the mountain where drier air sinks, compresses and warms up creating desert-like regions.



22. (2) **Rio de Janeiro is influenced by a warmer ocean current than Arica.** – You have to go through each of the choices to see which one would cause Arica to be cooler or Rio de Janeiro to be warmer.
- (1) Rio de Janeiro receives insolation at a higher angle than Arica. – This is false. Since Arica is closer to the Equator, Arica would have the higher angle of insolation.
 - (3) Arica is farther north than Rio de Janeiro. This is true - BUT being farther north in the Southern Hemisphere brings you closer to the Equator which would make Arica warmer – we want to see why Arica is cooler.
 - (4) Arica receives yearly insolation that is less intense than Rio de Janeiro. This is false as well. Since Arica is closer to the Equator, Arica would have the higher angle of insolation which causes it to have more intense rays, not less intense ones.
- (2) **Rio de Janeiro is influenced by a warmer ocean current than Arica.** – This is TRUE. By using the ESRT, you can see that the warm Brazil Current is located off the eastern coast of South America. This would warm up the coastal areas, such as Rio de Janeiro. Arica is actually affected by the cool Peru Current. Sooo... even though Arica is closer to the Equator, it is cooler than Rio.
23. (4) **December 21 through March 20** – Both cities are in the Southern Hemisphere, so both cities would experience their summer season while Northern Hemisphere locations experience the winter months (December – March)
24. (4) **water temperatures change more slowly than land temperatures do** – Water has a high specific heat – this means it heats up slower (keeps summer cooler), and cools down slower (retaining heat in winter, making it warmer).