

Basic Logic Problems

1. Tom has a higher GPA than Bill. Susan also had a higher GPA than Bill. Jessica has a higher GPA than Susan.

Which piece of information will allow you to conclude that Tom's GPA is higher than Susan's?

- a. Jessica's GPA is higher than Tom's.
 - b. Tom's GPA is higher than Jessica's.
 - c. Bill has the lowest GPA.
 - d. Jessica has the highest GPA.
 - e. It cannot be concluded from any of the above choices.
2. A Corvette is faster than a Jaguar. A Jaguar is faster than a Toyota Celica. A Toyota Celica is slower than a Ford Mustang.

Which piece of information will allow you to conclude that the Jaguar is faster than the Mustang?

- a. The Corvette is faster than the Ford Mustang.
 - b. The Corvette is faster than the Toyota Celica.
 - c. The Toyota Celica is slower than the Ford Mustang.
 - d. The Ford Mustang is faster than the Jaguar.
 - e. It cannot be concluded from any of the above choices.
3. Studies indicate that Japanese students tested in mathematics after the sixth grade are ahead of American students in math. Tests after the eighth grade indicate even greater differences. By the time they graduate from high school, Japanese students are far ahead of US students in math capabilities.

What is the most reasonable thing to conclude from the information in this passage?

- a. Over time, Japanese students develop more math ability than US students.
- b. Japanese students are particularly adept at mathematics.
- c. US students are generally not prepared for college mathematics.
- d. Japanese students study harder than US students.
- e. US students have a more difficult time learning math than Japanese students.

4. Studies indicate that tooth decay is preventable. One study showed that people who brushed their teeth twice daily had fewer cavities than those who brushed only once per day. Another study showed that people who flossed daily had less tooth decay than those who did not. Another piece of research indicated that people who eat candy more than three times per week have more cavities than those who do not eat candy.

What is the most reasonable thing to conclude from the information in this passage?

- a. People can do several things to lessen their chances for tooth decay.
 - b. Flossing is as effective as brushing in preventing tooth decay.
 - c. Brushing your teeth is the most important thing that you can do to prevent cavities.
 - d. Tooth decay is probably not preventable unless you floss.
 - e. Eating candy more than three times per week is not good for you.
5. An exhaustive study of more than 250,000 Americans conducted over four decades indicates that the more education a person has on average, the higher her salary is.

What is it reasonable to conclude from this statement?

- a. People who don't go to college can't make a very good living.
 - b. People who don't make a good living probably didn't go to college.
 - c. People who make a good living went to college.
 - d. If a person goes to college, she will make a good living.
 - e. None of the above.
6. In Dental Hygiene, the **attachment level** "is considered one of the most important measures of periodontal disease progress or treatment success."¹ **Attachment level** is a measurement of **pocket depth** and **gingival recession**.

Based upon this information only, what is it reasonable to conclude?

- a. If you know the measure of the gingival recession, but not the pocket depth, you may be able to estimate the attachment level.
- b. If you do not know both the pocket depth and the gingival recession, you cannot know the attachment level.
- c. If you want to measure the progress of periodontal disease, you must know the attachment level.
- d. The measure of pocket depth is an important indicator of gingival recession.
- e. All of the above are reasonable conclusions.

¹ <http://www.oralb.com/learningcenter/glossary/>

7. In dentistry, an abscess is "A localized inflammation due to a collection of pus in the bone or soft tissue, usually caused by an infection."²

Given this definition, which of the following is true?

- a. If a dental patient has an abscess, it is due to an infection.
 - b. If a patient has an infection, it will lead to an abscess.
 - c. Infections can occur in bones and in soft tissue.
 - d. Oral inflammations are usually localized.
 - e. Two of the above are true.
8. In dentistry, nitrous oxide (N₂O) is a gas that is given to patients "in order to decrease sensitivity to pain."³

Using only this information, which of the following is true?

- a. Nitrous oxide is harmless.
 - b. Nitrous oxide binds to pain receptors, thereby lessening pain.
 - c. Nitrous oxide may be helpful in certain surgical procedures.
 - d. Nitrous oxide must be administered with great care to children.
 - e. Three of the above are true.
9. If we knew that nitrous oxide was not harmless, what could we conclude?
- a. Nitrous oxide is harmful.
 - b. Nitrous oxide is harmful under at least some conditions, and perhaps all conditions.
 - c. Nitrous oxide is harmful under all conditions.
 - d. Nitrous oxide is harmless to some patients.
 - e. None of the above.

² http://www.cigna.com/health/consumer/dental/dental_glossary.html

³ Ibid.

10. A medical treatment that relieves pain yet does not cure the illness, problem, or disease is referred to as "**palliative**." Many patients receive palliative treatment from different kinds of doctors.

If palliative treatments do not actually cure anything, which of the following might be viable reasons to employ palliative treatments? (Select as many as are correct).

- a. A patient may be in pain, but have an incurable illness.
 - b. A patient may need alleviation from pain while awaiting a surgical procedure.
 - c. The physician might not know how to treat a particular illness, but may want to alleviate the patient's pain.
 - d. It may not be in the patient's best interest to know about a particular disease or illness; a palliative treatment may help a patient deal with pain under these conditions.
 - e. Certain patients have psychosomatic⁴ illnesses that cannot be treated because the illness is imagined, yet their pain is real.
11. General George Washington was the first President of the United States. He was elected President after the end of the Revolutionary War. General Washington commanded an army that played a decisive role in defeating the British in America's quest for independence.

Based upon this information, what might we reasonably conclude?

- a. Washington's role as a military leader may have played a role in his election as President.
- b. The Americans of Washington's age would only accept a man with military qualifications as President.
- c. No qualified candidates presented themselves to oppose Washington.
- d. The majority of early American voters were military men, leading them to strongly support General Washington.
- e. All of the above.

⁴ "Of or relating to a disorder having physical symptoms but originating from mental or emotional causes" (<http://www.dictionary.com>).

12. Hantavirus pulmonary is a disease that struck the Four Corners area (where the states of Arizona, New Mexico, Colorado, and Utah meet) in 1993 with devastating, frequently fatal consequences. As the name indicates, it is due to a Hantavirus. Hantavirus transmission to humans is by direct or indirect contact with the saliva or excreta of rodents such as deer mice, field mice, and ground voles. The HPS outbreak in Four Corners followed two years in which there was more rain, more foliage, and more deer mice than usual.⁵

The author of this article suggests that:

- a. In order to eliminate this dangerous virus, the rodent population that carries it should be eliminated.
- b. Humans in the Four Corners area of the United States are more susceptible to the Hantavirus than people in other regions.
- c. Human who contract this virus have probably kept these rodents as pets.
- d. There is a relationship between increased rain and foliage, and the outbreak of this disease.
- e. All of the above.
- f. None of the above.
- g. Two of the above.

⁵ <http://www.medterms.com/script/main/art.asp?articlekey=6409>

Answers

1. B
2. E
3. A
4. A
5. E
6. B
7. C
8. C
9. B
10. A, B, C, E (Regarding choice "C": the fact that a doctor does not know how to treat a particular malady does not mean that he will not refer the patient to another doctor. In the time that it takes to seek treatment from another doctor, pain alleviation may be important).
11. A
12. D