

## Unit 1 - Homework 2: Seasons, Solstices, and Equinoxes

In order to help you answers these questions, see pages 19—22 in Unit 1.

Every solar year, there are four seasons, because there are two solstices and two equinoxes. Indeed, the two solstices and two equinoxes segment the year into four seasons, because the seasons of the year change on the solstices and equinoxes.

1. A solar year lasts for approximately  $365\frac{1}{4}$  days, but what *is* a solar year?  
(Hint: There are 4 *equivalent answers* to this question, and you only need to give 1 of them.)
  
  
  
  
  
  
  
  
  
  
2. MATH: On average, every *solar* year is approximately  $365\frac{1}{4}$  days, and there are 4 seasons of the solar year.
  - (a) Approximately how many days long is each one of the four seasons in a solar year?  
(Note: The numerical expressions ' $365\frac{1}{4}$ ' and ' $365.25$ ' mean the very same thing.)
  
  
  
  
  
  - (b) *Show your work*. Show how you calculated your answer to the previous question.
  
  
  
  
  
  
  
  
  
  
3. Each day of the solar year, noon is the *time of day* when shadows are *shortest*, but what is the *day of the year* when shadows are *shortest* at noon?
  - vernal equinox
  - summer solstice
  - autumnal equinox
  - winter solstice

4. Each day of the solar year, noon is the *time of day* when shadows are *shortest*, but what is the *day of the year* when shadows are *longest* at noon?
  - vernal equinox
  - summer solstice
  - autumnal equinox
  - winter solstice
5. What is the day when the sun is the *highest* that it'll be in the sky for the entire solar year?
  - vernal equinox
  - summer solstice
  - autumnal equinox
  - winter solstice
6. Which day of the solar year has *the longest daytime and the shortest nighttime*?
  - vernal equinox
  - summer solstice
  - autumnal equinox
  - winter solstice
7. Which day of the solar year has *the shortest daytime and the longest nighttime*?
  - vernal equinox
  - summer solstice
  - autumnal equinox
  - winter solstice
8. Which two days of the solar year each have the same amount of daytime and nighttime?
  - vernal equinox
  - summer solstice
  - autumnal equinox
  - winter solstice
9. On the summer solstice, how long does nighttime last?
  - Nighttime lasts for *less* than 12 hours of a 24-hour day.
  - Nighttime lasts for approximately 12 hours of a 24-hour day.
  - Nighttime lasts for *more* than 12 hours of a 24-hour day.
10. On the summer solstice, how long does nighttime last?
  - Nighttime lasts for *less* than 12 hours of a 24-hour day.
  - Nighttime lasts for approximately 12 hours of a 24-hour day.
  - Nighttime lasts for *more* than 12 hours of a 24-hour day.
11. On the vernal equinox, how long does nighttime last?
  - Nighttime lasts for *less* than 12 hours of a 24-hour day.
  - Nighttime lasts for approximately 12 hours of a 24-hour day.
  - Nighttime lasts for *more* than 12 hours of a 24-hour day.

12. On the autumnal equinox, how long does nighttime last?

- Nighttime lasts for *less* than 12 hours of a 24-hour day.
- Nighttime lasts for approximately 12 hours of a 24-hour day.
- Nighttime lasts for *more* than 12 hours of a 24-hour day.

13. The Ancient Egyptians understood how there were two equinoxes and two solstices in a solar year, but they instead believed that there were only *three* seasons (rather than *four*). What were the *three* seasons of the Ancient Egyptian year? Write them in order.

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