

Name

Class

Date

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CHAPTER 2 - USER'S GUIDE TO THE SKY: PATTERNS AND CYCLES

1.

Which of the following definitions best describes a constellation?

- a. a region of the sky containing a certain star pattern
- b. a group of very bright stars
- c. a group of very faint stars
- d. a region of the sky containing a very high number of stars

ANSWER:

a

2.

How long would you have to wait to see a change in the pattern of stars in the night sky?

- a. several decades
- b. thousands of years
- c. millions of years
- d. forever, the pattern of stars will never change

ANSWER:

b

3.

How many official constellations are there?

- | | | | |
|----|----|----|----|
| a. | 98 | b. | 88 |
| c. | 13 | d. | 55 |

ANSWER:

b

4.

Which of the following best describes the Big Dipper?

- | | |
|-------------------|------------------------------|
| a. an asterism | b. a faint star near Polaris |
| c. the North Star | d. a constellation |

ANSWER:

a

5.

What do stars in the same constellation have in common?

- a. They probably formed at the same time.
- b. They must be part of the same cluster of stars in space.
- c. They must have been discovered at about the same time.
- d. They are in the same part of the sky as seen from the Earth.

ANSWER:

d

6.

Which of the following best describes Ursa Major (the Great Bear)?

- | | |
|--------------------|---------------------------------------|
| a. a constellation | b. another name for the Seven Sisters |
| c. an asterism | d. another name for the Big Dipper |

ANSWER:

a

7.

Which of the following statements correctly describes the relationship between stars and constellations?

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- a. Only stars close to the ecliptic (the Earth's orbital plane) are located in constellations.
- b. Every star is located in a constellation.
- c. Only the brighter stars are in constellations.
- d. Only those stars that were visible to the ancient Greeks are located in constellations.

ANSWER:

b

8.

What language is the source of most star names, such as Aldebaran and Betelgeuse?

- | | |
|-----------|------------|
| a. Latin | b. Greek |
| c. Arabic | d. Italian |

ANSWER:

c

9.

If the apparent visual magnitude of a star is 7.3, what does this tell us about the brightness of the star?

- a. It is one of the brighter stars in the sky.
- b. It is bright enough that it would be visible even during the day.
- c. It is not visible with the unaided eye.
- d. It appears faint because of its great distance from the Earth.

ANSWER:

c

10.

The star Vega has an apparent visual magnitude of 0.03 and the star HR 4374 has an apparent visual magnitude of 4.87. It has been determined that both stars are at the same distance from the Earth. What does this information tell us about the two stars?

- a. Together the two stars would have a magnitude of 4.9.
- b. Vega must produce less energy per second than HR 4374.
- c. Vega must produce more energy per second than HR 4374.
- d. Vega will appear fainter to us than HR 4374.

ANSWER:

c

11.

Which of the following describes the magnitude scale?

- a. It originated just after the telescope was invented.
- b. It can be used to indicate the apparent brightness of a star.
- c. It is no longer used today.
- d. It was used to determine the rate of precession.

ANSWER:

b

12.

What is the apparent visual magnitude of a star a measure of?

- a. the star's size as perceived by human eyes on Earth
- b. the star's temperature as perceived by human eyes on Earth
- c. the star's colour as seen by human eyes on Earth
- d. the star's brightness as seen by human eyes on Earth

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ANSWER: d

13.
What kind of letters are used to identify stars in a constellation?

- a. Arabic letters
- b. Italic letters
- c. Latin letters
- d. Greek letters

ANSWER: d

14.
If the apparent visual magnitude of star A is 3.1, and the apparent visual magnitude of star B is 0.5, how do star A and star B compare in terms of apparent brightness as seen from Earth?

- a. Star A is fainter than star B.
- b. Star A is much brighter than star B.
- c. Star A is about the same brightness as star B.
- d. Star A is only slightly brighter than star B.

ANSWER: a

15.
What is the purpose of the magnitude scale?

- a. It measures the apparent location of objects that appear in the sky.
- b. It measures the apparent size of objects that appear in the sky.
- c. It measures the apparent brightness of objects that appear in the sky.
- d. It measures the apparent speed of objects that appear in the sky.

ANSWER: c

16.
Refer to Table 2-1. Which star in the table would appear brightest to an observer on Earth?

- a. α Dra
- b. α Cet
- c. Nim
- d. α CMa

ANSWER: d

17.
Refer to Table 2-1. Which star in the table would be *invisible* to the unaided eye of an observer on Earth?

- a. α Dra
- b. α Cet
- c. Nim
- d. α CMa

ANSWER: c

18.
What causes the precession of Earth's rotation axis?

- a. the force of gravity from the Sun and Moon on Earth's equatorial bulge
- b. the force of gravity from the Sun and Jupiter on the Earth–Moon system
- c. the magnetic field of Earth
- d. the impacts of asteroids

ANSWER: a

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19.

Where is an observer's nadir?

- a. the east point on the observer's horizon
- b. the north point on the observer's horizon
- c. the point directly opposite the observer's zenith
- d. the point directly opposite the north celestial pole

ANSWER:

c

20.

What aspect of an object depends on both the size of the object and the distance to the object?

- a. apparent brightness
- b. apparent magnitude
- c. angular diameter
- d. proper motion

ANSWER:

c

21.

Which of the following is equivalent to 1/3600th of a degree?

- a. 1/60 of an arc second
- b. 1 arc second
- c. 1 arc minute
- d. 60 arc minutes

ANSWER:

b

22.

What is the term for the point on the celestial sphere directly above an observer, no matter where on the Earth the observer is located?

- a. north celestial pole
- b. south celestial pole
- c. zenith
- d. nadir

ANSWER:

c

23.

Where is the zenith for an observer standing at a point on the Earth's equator?

- a. directly overhead
- b. near the horizon and towards the south
- c. near the horizon and towards the west
- d. the position depends on the time of day

ANSWER:

a

24.

An observer in the northern hemisphere watches the sky for several hours. Due to the motion of the Earth, this observer notices that the stars near the north celestial pole appear to move. What pattern does this apparent movement follow?

- a. clockwise around the celestial pole
- b. counter-clockwise around the celestial pole
- c. from left to right
- d. from right to left

ANSWER:

b

25.

The Moon has an angular diameter of 0.5°. What is the Moon's angular diameter in minutes of arc?

- a. 0.5
- b. 30

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- c. 50 d. 1800

ANSWER: b

26.
You point your finger toward the zenith right now, and then point there again six hours later. At both times, your finger was pointing in the same direction relative to one of the options below. Which one?

- a. your horizon b. the Sun
c. the Moon d. the fixed stars

ANSWER: a

27.
If an observer travels north, toward higher latitudes, how does the number of circumpolar stars that he or she sees in the sky change?

- a. remains constant
b. decreases
c. increases
d. also depends on the longitude of the observer

ANSWER: c

28.
If you were standing at the Earth's North Pole, which of the following would be located at the zenith?

- a. the nadir b. the star Vega
c. the celestial equator d. the north celestial pole

ANSWER: d

29.
How much of the night sky lies north of the celestial equator?

a. Less than half, because of the tilt of the equator to the ecliptic plane.
b. More than half, because of the precession of the poles.
c. Exactly half.
d. All of the night sky.

ANSWER: c

30.
If you were standing on the Earth's equator, which of the following in the sky would pass through your zenith during the entire day (24 hours)?

- a. the north celestial pole b. the south celestial pole
c. the celestial equator d. circumpolar constellations

ANSWER: c

31.
Seen from Winnipeg (latitude 50 degrees North), where is the star Polaris in the sky?

a. directly overhead b. 40 degrees above the horizon
c. 50 degrees above the horizon d. the position depends on the time of day

ANSWER: c

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32.

Seen from Yellowknife (latitude 62 degrees North), where is the star Polaris in the sky?

- a. directly overhead
- b. 62 degrees above the horizon
- c. 28 degrees above the horizon
- d. the position depends on the time of day

ANSWER:

b

33.

For an observer in Pond Inlet, Nunavut, at a latitude of 73° North, what is the angle between the northern horizon and the north celestial pole?

- a. 17°
- b. 23.5°
- c. 27°
- d. 73°

ANSWER:

d

34.

For an observer in Valdivia, Chile, at a latitude of 39° South, what is the angle between the southern horizon and the south celestial pole?

- a. 23.5°
- b. 45°
- c. 39°
- d. 51°

ANSWER:

c

35.

For an observer in New Delhi, India, at a latitude of 28° North, what is the angle between the northern horizon and the north celestial pole?

- a. 5°
- b. 28°
- c. 40°
- d. 62°

ANSWER:

b

36.

For an observer in Lusaka, Zambia, at a latitude of 16° South, what is the angle between the southern horizon and the south celestial pole?

- a. 16°
- b. 23.5°
- c. 74°
- d. 164°

ANSWER:

a

37.

For an observer in Toronto, at a latitude of 44° North, what is the angle between the northern horizon and the north celestial pole?

- a. 23.5°
- b. 36°
- c. 44°
- d. 74°

ANSWER:

c

38.

For an observer in Oberon Bay, Australia, at a latitude of 39° South, what is the angle between the southern horizon and the south celestial pole?

- a. 23.5°
- b. 39°

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- c. 45° d. 51°

ANSWER:

b

39.

If the north celestial pole appears on your horizon, what is your latitude?

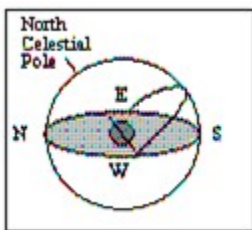
- a. 0° b. 45° N
c. 90° N d. 90° S

ANSWER:

a

40.

What is the approximate latitude of the observer in the diagram?



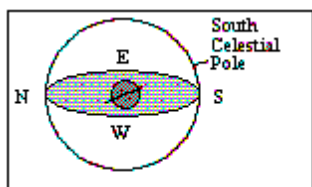
- a. 50° N b. 50° S
c. 90° N d. 90° S

ANSWER:

a

41.

What is the approximate latitude of the observer in the diagram?



- a. 20° N b. 20° S
c. 70° N d. 0°

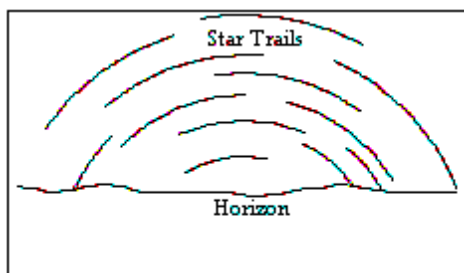
ANSWER:

b

42.

An observer in the northern hemisphere takes a time exposure photograph of the night sky. If the illustration depicts the photograph taken by the observer, which direction was the camera pointing?

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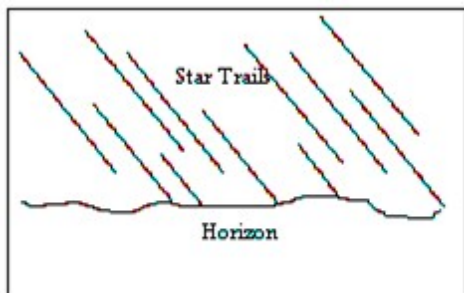
- a. due north
- b. due south
- c. due east
- d. straight up, directly overhead

ANSWER:

b

43.

An observer in the northern hemisphere takes a time exposure photograph of the night sky. If the illustration depicts the photograph taken by the observer, which direction was the camera pointing?



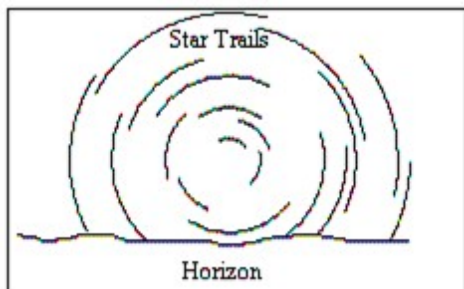
- a. due north
- b. due south
- c. due west
- d. straight up, directly overhead

ANSWER:

c

44.

An observer in the southern hemisphere takes a time exposure photograph of the night sky. If the illustration depicts the photograph taken by the observer, which direction was the camera pointing?



- a. due south
- b. due east
- c. due west
- d. straight up, directly overhead

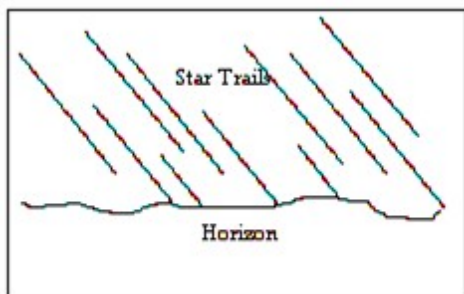
ANSWER:

a

45.

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An observer in the southern hemisphere takes a time exposure photograph of the night sky. If the illustration depicts the photograph taken by the observer, which direction was the camera pointing?



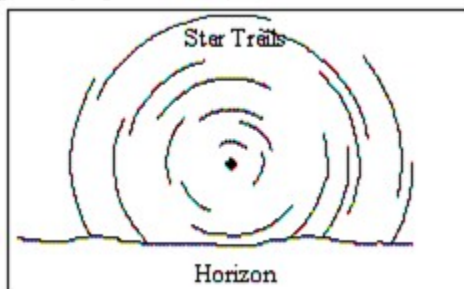
- a. due north
- b. due south
- c. due east
- d. due west

ANSWER:

c

46.

An observer in the northern hemisphere takes a time exposure photograph of the night sky. If the illustration depicts the photograph taken by the observer, which direction was the camera pointing?



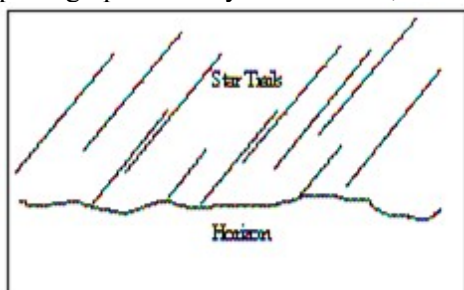
- a. due north
- b. due south
- c. due west
- d. straight up, directly overhead

ANSWER:

a

47.

An observer in the southern hemisphere takes a time exposure photograph of the night sky. If the illustration depicts the photograph taken by the observer, which direction was the camera pointing?



- a. due north
- b. due south
- c. due east
- d. due west

ANSWER:

d

48.

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You look at a time exposure photograph of the night sky taken in the northern hemisphere and notice that each circumpolar star traces one-eighth of a complete circle around Polaris. What was the exposure time for the photograph?

- a. 1 hour
- b. 3 hours
- c. 4 hours
- d. 8 hours

ANSWER:

b

49.

Where in the sky would an observer at the Earth's equator see the celestial equator?

- a. The celestial equator would be at 45 degrees above the northern horizon.
- b. The celestial equator would be at 45 degrees above the southern horizon.
- c. The celestial equator would coincide with the horizon.
- d. The celestial equator would be directly overhead.

ANSWER:

d

50.

What is the celestial equator?

- a. the dividing line between the north and south celestial hemispheres
- b. a line around the sky directly above the Earth's poles
- c. the path that the Sun appears to follow on the celestial sphere as the Earth orbits the Sun
- d. the path that the planets appear to follow in the sky

ANSWER:

a

51.

How far, and in what direction, does the Sun appear to move on the celestial sphere per day?

- a. about one degree westward
- b. about one degree eastward
- c. about 360 degrees westward
- d. about 360 degrees eastward

ANSWER:

b

52.

Which of the following best defines the ecliptic?

- a. the plane that is perpendicular to the Earth's axis of rotation
- b. the projection of the Earth's equator onto the sky
- c. the path traced out by the Moon in our sky in one month against the background stars
- d. the path traced out by the Sun in our sky over one year against the background stars

ANSWER:

d

53.

What is the ecliptic?

- a. the centre line of the celestial sphere
- b. the projection of the Earth's orbit on the sky
- c. the apparent path of the Moon around the sky
- d. the line between east and west, passing through the zenith

ANSWER:

b

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54.

Which planet(s) in our solar system is (are) never visible to the naked eye?

- a. Mercury and Neptune
- b. Saturn, Uranus, and Neptune
- c. Neptune
- d. Mercury and Venus

ANSWER:

c

55.

If you see the Sun pass directly overhead on at least one day per year, then where are you on Earth?

- a. within 23.5° latitude of the equator
- b. within 66.5° latitude of the equator
- c. exactly on the equator
- d. could be anywhere, because this occurs at least once per year at any location on the Earth

ANSWER:

a

56.

Through the year, the Sun moves eastward among the stars following a line called the

- a. equator
- b. horizon
- c. ecliptic
- d. zenith

ANSWER:

c

57.

Why are Venus and Mercury often called “morning star” and “evening star”?

- a. They look more like stars than the other planets do.
- b. They both rotate quite slowly and have long mornings and evenings.
- c. They are both reddish in colour, like the Sun near the horizon.
- d. They are visible only just before sunrise or just after sunset.

ANSWER:

d

58.

In Brazil, in what month does the longest period of daylight occur?

- a. March
- b. June
- c. September
- d. December

ANSWER:

d

59.

Around what date is the amount of solar energy per square metre that is incident upon the surface of the Earth in the northern hemisphere at its lowest level?

- a. December 21, the winter solstice
- b. March 21, the vernal equinox
- c. June 21, the summer solstice
- d. September 21, the autumnal equinox

ANSWER:

a

60.

If the Earth's rotational axis shifted to a position perpendicular to the ecliptic, what would happen to seasonal variations on the Earth?

- a. They would be non-existent.

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- b. They would remain the same as they are now.
- c. They would have the same severity but each season would last twice as long.
- d. They would be much more severe.

ANSWER:

a

61.

If the perihelion of the Earth was significantly closer to the Sun than is currently the case, what would be the probable effect on the climate of the Southern Hemisphere?

- a. The winter season would be much colder than at present.
- b. The winter season would be much warmer than at present.
- c. The summer season would be much colder than at present.
- d. The summer season would be much warmer than at present.

ANSWER:

d

62.

What is the term for the point in the Earth's orbit where the Earth is farthest from the Sun?

- | | |
|---------------|------------------------|
| a. aphelion | b. perihelion |
| c. precession | d. the winter solstice |

ANSWER:

a

63.

What is the term for the point in the Earth's orbit where the Earth is closest to the Sun?

- | | |
|---------------|-----------------------|
| a. aphelion | b. perihelion |
| c. precession | d. the vernal equinox |

ANSWER:

b

64.

On the vernal equinox (March 21), where is the Sun on the celestial sphere?

- a. 23.5° north of the celestial equator
- b. 23.5° south of the celestial equator
- c. on the celestial equator and moving north with respect to the equator
- d. on the celestial equator and moving south with respect to the equator

ANSWER:

c

65.

On the autumnal equinox (Sept. 21), where is the Sun on the celestial sphere?

- a. 23.5° north of the celestial equator
- b. 23.5° south of the celestial equator
- c. on the celestial equator and moving north with respect to the equator
- d. on the celestial equator and moving south with respect to the equator

ANSWER:

d

66.

At which of the following times would you find the Sun on the celestial equator?

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- a. vernal equinox and summer solstice
- b. autumnal equinox and vernal equinox
- c. summer solstice and winter solstice
- d. autumnal equinox and winter solstice

ANSWER:

b

67.

At what two celestial locations do the celestial equator and the ecliptic coincide?

- a. winter solstice and summer solstice
- b. vernal equinox and autumnal equinox
- c. north celestial pole and south celestial pole
- d. zenith and east point

ANSWER:

b

68.

The diagram shows three approximate locations of the Sun along the western horizon. Which number indicates the location of the Sun at sunset on December 21st (winter solstice) for an observer at latitude 48° North?

- a. 1
- b. 2
- c. 3
- d. The Sun will not set on December 21st at this latitude.

ANSWER:

a

69.

The diagram shows three approximate locations of the Sun along the western horizon. Which number indicates the location of the Sun at sunset on autumnal equinox (Sept. 21) for an observer at a latitude of 45° North?

- a. 1
- b. 2
- c. 3
- d. The Sun will not set on the autumnal equinox at this latitude.

ANSWER:

b

70.

The diagram shows three approximate locations of the Sun along the western horizon. Which number indicates the location of the Sun at sunset on the vernal equinox (March 21) for an observer at a latitude of 48° South?

- a. 1
- b. 2
- c. 3
- d. The Sun will not set on the vernal equinox at this latitude.

ANSWER:

b

71.

The diagram shows three approximate locations of the Sun along the western horizon. Which number indicates the location of the Sun at sunset on June 21 (summer solstice) for an observer at a latitude of 37° North?

- a. 1
- b. 2

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- c. 3
- d. The Sun will not set on June 21 at this latitude.

ANSWER:

c

72.
The diagram shows three approximate locations of the Sun along the western horizon. Which number indicates the location of the Sun at sunset on June 21 (summer solstice) for an observer at a latitude of 77° North?

- a. 1
- b. 2
- c. 3
- d. The Sun will not set on June 21 at this latitude.

ANSWER:

d

73.
Why are Northern Hemisphere winters colder than Northern Hemisphere summers?

- a. The Earth is closer to the Sun during the summer than it is during the winter.
- b. The snow that falls in the northern latitudes cools the Earth during the winter.
- c. The light from the Sun shines more directly on the Northern Hemisphere during the summer.
- d. The period of sunlight is shorter during the summer than during the winter.

ANSWER:

c

74.
What is the angle between the noon Sun at the winter solstice and the southern horizon for an observer at a latitude of 38° North?

- | | |
|-----------------|-----------------|
| a. 28.5° | b. 38° |
| c. 52° | d. 75.5° |

ANSWER:

c

75.
What is the term for a set of beliefs that appears to be based on scientific ideas, but which fails to obey the most basic rules of science?

- | | |
|------------------|---------------------|
| a. theory | b. hypothesis |
| c. pseudoscience | d. scientific model |

ANSWER:

c

76.
Relative to the stars, the Moon moves eastward in the sky each night. About how far does it move?

- | | |
|-----------------|-----------------|
| a. 1° | b. 13° |
| c. 27.3° | d. 29.5° |

ANSWER:

b

77.
What determines the phase of the Moon on a particular night?

- a. the speed of the Moon in its orbit
- b. the relative positions of the Sun, the Earth, and the Moon

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- c. how the Earth's shadow hits the moon
- d. the distance from the Earth to the Moon

ANSWER:

b

78.

If you lived on the near side of the Moon, how often would the Earth set below your horizon?

- a. every 24 hours
- b. once a sidereal period (27.3 days)
- c. once a synodic period (29.5 days)
- d. never

ANSWER:

d

79.

On a clear night, when an observer in Vancouver sees a first quarter Moon, what would an observer in St. John's see?

- a. a new Moon
- b. a first quarter Moon
- c. a third quarter Moon
- d. a full Moon

ANSWER:

b

80.

When does the first quarter Moon rise?

- a. at about noon
- b. at sunset
- c. at sunrise
- d. at about midnight

ANSWER:

a

81.

What is the term for the Moon when it is visible above the western horizon a couple of hours before sunrise?

- a. the waning gibbous Moon
- b. the waxing gibbous Moon
- c. the waxing crescent Moon
- d. the waning crescent Moon

ANSWER:

a

82.

What is the term for the Moon when it is visible above the eastern horizon a couple of hours before sunrise?

- a. the waning gibbous Moon
- b. the waxing gibbous Moon
- c. the waxing crescent Moon
- d. the waning crescent Moon

ANSWER:

d

83.

When and where is a waxing crescent Moon visible?

- a. near the eastern horizon just before sunrise
- b. near the eastern horizon just after sunset
- c. near the western horizon just before sunrise
- d. near the western horizon just after sunset

ANSWER:

d

84.

When and where is a third quarter Moon visible?

- a. near the eastern horizon just after sunset
- b. in the southern sky at sunrise

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c. in the southern sky at sunset

d. from sunset until sunrise

ANSWER:

b

85.

If someone on Earth observes the Moon in the third quarter phase, what phase would someone on the Moon facing Earth observe Earth in?

a. the full Earth phase

b. the third quarter Earth phase

c. the first quarter Earth phase

d. the new Earth phase

ANSWER:

c

86.

If the Moon is setting at 6 a. m. , what phase must the Moon be in?

a. full

b. new

c. third quarter

d. first quarter

ANSWER:

a

87.

When and where is a first quarter Moon visible?

a. near the eastern horizon just after sunset

b. in the southern sky at sunrise

c. in the southern sky at sunset

d. from sunset until sunrise

ANSWER:

c

88.

If the Moon is setting at noon, what phase must the Moon be in?

a. first quarter

b. new

c. third quarter

d. waxing crescent

ANSWER:

c

89.

When does the full Moon occur?

a. on the 15th of every month

b. when the Moon is at right angles to the direction of the Sun

c. when the Moon is closer to Sun than the Earth is

d. when the Moon is directly opposite the position of the Sun

ANSWER:

d

90.

In which direction does the daily motion of the Moon occur in the sky, against the background stars, when viewed from the Earth?

a. toward the west

b. toward the east

c. toward the north celestial pole in the summer and the south celestial pole in the winter

d. No predictable pattern can be discerned.

ANSWER:

b

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91.

What is the term for a solar eclipse in which the Moon's umbra reaches the Earth's surface?

- a. a total solar eclipse
- b. a partial solar eclipse
- c. a penumbral solar eclipse
- d. an umbral solar eclipse

ANSWER:

a

92.

When does a solar or lunar eclipse occur?

- a. when the Sun is near the plane of the Moon's orbit, and the Moon is new or full
- b. any time the Moon is new or full
- c. halfway through an eclipse year
- d. when the Sun is near the equinox and the Moon is new or full

ANSWER:

a

93.

What is the term for a solar eclipse in which the Moon's umbra does not reach the Earth's surface?

- a. a partial solar eclipse
- b. an annular solar eclipse
- c. a penumbral solar eclipse
- d. an umbral solar eclipse

ANSWER:

b

94.

What is the term for a lunar eclipse in which the Moon moves completely into the Earth's umbral shadow?

- a. a partial lunar eclipse
- b. an annular eclipse
- c. a penumbral lunar eclipse
- d. a total lunar eclipse

ANSWER:

d

95.

How does the Moon's appearance change during a total lunar eclipse?

- a. The Moon goes from new to full.
- b. The Moon disappears.
- c. The Moon turns a dark red colour.
- d. The Moon's far side is visible.

ANSWER:

c

96.

Which of the following is 18 years and 11-1/3 days long?

- a. sidereal period
- b. synodic period
- c. eclipse season
- d. Saros cycle

ANSWER:

d

97.

What is the Saros cycle?

- a. the pattern of repetition of solar and lunar eclipses
- b. the time between annular eclipses at a particular location
- c. the number of full Moons in a year
- d. the pattern of events that happen in a single eclipse

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ANSWER:

a

98.

Why does a totally eclipsed Moon glow coppery red?

- a. Only red light can pass through the Earth's shadow and reach the Moon.
- b. During a lunar eclipse the Moon reflects only red light from the Sun.
- c. During a lunar eclipse the Sun is cooler than normal, so its light is redder.
- d. Only red light is able to pass completely through the Earth's atmosphere and reach the Moon.

ANSWER:

d

99.

The Moon's umbral shadow usually does not produce a total solar eclipse. Why not?

- a. shadow is too bright
- b. shadow is too faint
- c. shadow is too long
- d. shadow is too short

ANSWER:

d

100.

Where is a total lunar eclipse visible?

- a. It is visible only from the path of totality.
- b. It is visible only to observers who can see the new Moon.
- c. It is visible to all observers on the side of the Earth facing the Moon.
- d. It is visible only from the Earth's equator.

ANSWER:

c

101.

When do total lunar eclipses always occur?

- a. at the time of new Moon
- b. at the time of full Moon
- c. during either equinox
- d. during either solstice

ANSWER:

b

102.

Which event could occur about two weeks after a total lunar eclipse?

- a. a total solar eclipse
- b. another total lunar eclipse
- c. a full Moon
- d. a partial lunar eclipse

ANSWER:

a

103.

If the Moon's orbital plane was aligned with the celestial equator, when would eclipses occur?

- a. every month
- b. never
- c. only at solstices
- d. only at the equinoxes

ANSWER:

d

104.

Why doesn't the Earth experience a solar eclipse every month?

- a. Unpredictable weather patterns obscure the Moon.

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- b. The Moon always keeps its same side toward the Earth.
- c. The Moon's orbit is not aligned with the Earth's orbit.
- d. Sometimes the Moon is too far away.

ANSWER:

c

105.

A total solar eclipse occurred in Brandon, Manitoba, on Feb. 26, 1979. At what other date was there (or will there be) the same eclipse visible at this location?

- a. March of 1979
- b. August of 1979
- c. January of 2000
- d. March of 2033

ANSWER:

d

106.

During a total lunar eclipse, where is the Moon?

- a. in the solar umbra
- b. in the Earth's umbra
- c. between the Earth and the Sun
- d. at its greatest distance from the Earth

ANSWER:

b

107.

Why is it possible to view a total solar eclipse from Earth?

- a. because the Sun and the Moon have nearly the same diameter
- b. because the Sun and the Moon have nearly the same angular diameter when viewed from Earth
- c. because the Sun and the Moon are at nearly the same distance from Earth
- d. because the Moon orbits Earth in the same plane that Earth orbits the Sun

ANSWER:

b

108.

Suppose Earth orbited half as far from the Sun but that the size of the Moon and its orbit around Earth were the same as they are today. Which of the following statements would be true?

- a. It would not be possible to experience a total solar eclipse from Earth.
- b. It would not be possible to experience a partial solar eclipse from Earth.
- c. A total solar eclipse would occur every month at some point on Earth.
- d. Total solar eclipses would last twice as long.

ANSWER:

a

109.

If the Sun were twice as large but remained at its current distance from Earth, which of the following changes would allow people on Earth to still experience a total solar eclipse?

- a. Double the size of the Moon and double the size of its orbit around Earth.
- b. Keep the Moon at its current size but double the size of its orbit around Earth.
- c. Keep the Moon at its current size but halve the size of its orbit around Earth.
- d. Halve the size of the Moon and keep the size of its orbit around Earth the same.

ANSWER:

c

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110.

Which of the following describes a concept very similar to latitude?

- | | |
|--------------------|----------------|
| a. right ascension | b. declination |
| c. magnitude | d. meridian |

ANSWER:

b

111.

For an observer at the North Pole, what is the angular distance between a star at a declination of $+30^\circ$ and the zenith?

- | | |
|---------------|----------------|
| a. 30° | b. 60° |
| c. 90° | d. 150° |

ANSWER:

b

112.

The star delta Cephei has a declination of about $+58.5$ degrees. Which observer will see it above their horizon for the longest fraction of one night?

- a. an observer in Valdivia, Chile, at a latitude of 39° S
- b. an observer in Windhoek, Namibia, at a latitude of 22.5° S
- c. an observer in Zacatecas, Mexico, at a latitude of 22.5° N
- d. an observer in Edmonton, Canada, at a latitude of 53.5° N

ANSWER:

d

113.

How much does the RA coordinate of the Sun change in 2 months?

- | | |
|--------------------------------|-------------------|
| a. 0 hours, it does not change | b. about 2 hours |
| c. about 4 hours | d. about 24 hours |

ANSWER:

c

114.

The second is defined as a fixed interval of time, with no reference to astronomical timescales. If the Earth's period of rotation doubled, but its period of revolution stayed the same, what would happen?

- a. There would half as many seconds in the day.
- b. There would be twice as many seconds in the day.
- c. There would be half as many seconds in the year.
- d. There would be twice as many seconds in the year.

ANSWER:

b

115.

Which of the following measures time relative to the stars?

- | | |
|------------------|------------------|
| a. solar day | b. sidereal day |
| c. tropical year | d. synodic month |

ANSWER:

b

116.

You want to observe the star Arcturus just as it crosses the meridian. If the meridian crossing happens at exactly 9:00 p.m. tonight, at what time will it occur 7 days from now, at the same location?

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- a. 8:32 p. m.
- b. 9:00 p. m.
- c. 9:28 p. m.
- d. 6:00 a. m.

ANSWER:

a

117.

Why does the Gregorian calendar use leap years?

- a. because the tropical year is about 365. 25 days long
- b. because the sidereal year is longer than the tropical year
- c. because Earth's axis is precessing
- d. because Earth's rotation is slowing down

ANSWER:

a

118.

What is the term for the period of time it takes for the Moon to complete a cycle of the lunar phases that is approximately 29. 5 days long?

- a. sidereal period of the Moon
- b. Saros cycle of the Moon
- c. synodic period of the Moon
- d. eclipse season of the Moon

ANSWER:

c

119.

Why is the Moon's synodic period longer than its sidereal period?

- a. because most months have more than 27 days
- b. because the Sun moves faster than the Moon
- c. because Earth has moved along its orbit during a sidereal period
- d. because one complete orbit of the Moon around Earth takes longer than the cycle of lunar phases

ANSWER:

c

120.

What is the sidereal period of the Moon?

- a. the period of time between one full Moon and the next
- b. the period of time for the Moon to orbit the Earth once with respect to the stars
- c. the period of time between successive eclipses at a given location on Earth
- d. the period of time from when the Moon rises until the Moon rises again the next night

ANSWER:

b

121.

What is apparent solar time?

- a. the time between successive meridian crossings of a particular star
- b. time measured relative to successive meridian crossings of the Sun
- c. the period of time between successive solar eclipses at a given location on Earth
- d. time measured relative to sunrise and sunset

ANSWER:

b

122.

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Do the constellations visible in the sky at a particular time of night (say, 9 p. m.) follow a seasonal pattern?

- a. No; the same constellations are visible at 9 p. m. on any clear night of the year.
- b. No; as the year progresses, the constellations visible at 9 p. m. are the same but their shapes change.
- c. Yes; at 9 p. m. on a clear winter night, ALL of the constellations you can see are different from the ones that appear at the same time on a summer night.
- d. Yes; at 9 p. m. on a summer night, MOST of the constellations you can see are different from those you can see on a winter night. Some constellations are visible all year long.

ANSWER: d

123.

During the month of June, the north celestial pole points towards Polaris; where does it point during the month of December?

- a. just south of Polaris
- b. towards the star Vega
- c. towards the star Thuban
- d. still towards Polaris

ANSWER: d

124.

Which of the following is a prominent constellation in the Canadian winter sky?

- a. Taurus
- b. Aquila
- c. Cygnus
- d. Virgo

ANSWER: a

125.

In what season is the constellation of Orion most visible in Canada?

- a. spring
- b. summer
- c. fall
- d. winter

ANSWER: d

126.

Which of the following constellations is visible year-round in most of Canada?

- a. Gemini
- b. Libra
- c. Orion
- d. Cassiopeia

ANSWER: d

127.

Why is the constellation Leo **not** visible all year from Canada?

- a. Leo is in the southern celestial hemisphere.
- b. Leo is on the ecliptic, so it is sometimes directly behind the Sun in the sky.
- c. Leo is on the celestial equator, so it is often directly behind the Moon in the sky.
- d. Leo has no stars visible to the unaided eye.

ANSWER: b

128.

In what two seasons does the Milky Way arc from east to west in the sky, as seen from Canada?

- a. winter and spring
- b. spring and summer

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c. summer and fall

d. fall and winter

ANSWER:

d

129.

_____ is a measure of the light energy that hits one square metre in one second.

ANSWER:

Flux

130.

Star A has an apparent visual magnitude of 6.3 and star B has an apparent visual magnitude of 5.3. Star A is _____ than star B.

ANSWER:

fainter

131.

The _____ is the point on the celestial sphere directly above an observer, regardless of where the observer is located on Earth.

ANSWER:

Zenith

132.

The full Moon has an angular diameter of approximately _____ arc minutes for an observer located on the surface of the Earth.

ANSWER:

30 (thirty)

133.

The Earth's rotation axis _____ slowly so that in a few thousand years Polaris will no longer be the North Star.

ANSWER:

precesses

134.

_____ is the point in the Earth's orbit when the Earth is closest to the Sun.

ANSWER:

Perihelion

135.

The planets _____ and _____ are never visible near the eastern horizon at sunset.

ANSWER:

Mercury, Venus OR Venus, Mercury

136.

For a northern hemisphere observer, the _____ Moon is visible in the south-eastern sky just after sunset.

ANSWER:

waxing gibbous

137.

A(n) _____ eclipse occurs when the Moon is at its greatest distance from the Earth, and the Moon is new.

ANSWER:

annular

138.

The _____ period of the Moon is the time required for one revolution of the Moon around the Earth with respect to the stars.

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ANSWER: sidereal

139.
The constellations were created by the Greeks.

- a. True
- b. False

ANSWER: False

140.
A second magnitude star in Ursa Major is brighter than a fourth magnitude star in Orion.

- a. True
- b. False

ANSWER: True

141.
The Greek letter designation conveys information about a star's location and brightness.

- a. True
- b. False

ANSWER: True

142.
The celestial equator always passes directly overhead.

- a. True
- b. False

ANSWER: False

143.
The celestial equator always crosses the horizon at the east point and west point.

- a. True
- b. False

ANSWER: True

144.
Navigators can find their latitude in the northern hemisphere by measuring the angle from the northern horizon to the north celestial pole.

- a. True
- b. False

ANSWER: True

145.
A scientific model is a mental conception that provides a framework that helps us think about some aspect of nature.

- a. True
- b. False

ANSWER: True

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146.
The constellation of Orion is currently visible in the evenings in January. Precession will not affect this, and 13,000 years from now Orion will still be visible in January.

- a. True
- b. False

ANSWER: False

147.
A third magnitude star is three times brighter than a first magnitude star.

- a. True
- b. False

ANSWER: False

148.
As the Earth rotates, circumpolar stars appear to move counterclockwise around the north celestial pole.

- a. True
- b. False

ANSWER: True

149.
The third quarter Moon rises at noon.

- a. True
- b. False

ANSWER: False

150.
During an annular eclipse of the Sun, the corona of the Sun is visible.

- a. True
- b. False

ANSWER: False

151.
A total solar eclipse will be visible from the same location on Earth one Saros cycle later.

- a. True
- b. False

ANSWER: False

152.
The path of totality for a solar eclipse is swept out by the tip of the Moon's umbra as the umbra moves over the Earth.

- a. True
- b. False

ANSWER: True

153.
A total lunar eclipse is visible only from the path of totality.

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- a. True
- b. False

ANSWER: False

154.
If you were on the Moon during a total lunar eclipse, the Sun would be hidden behind the Earth.

- a. True
- b. False

ANSWER: True

155.
The totally eclipsed Moon glows coppery red because sunlight reaches the Moon's surface after passing through the Earth's atmosphere.

- a. True
- b. False

ANSWER: True

156.
An eclipse season is the interval during which the Sun crosses a node of the Moon's orbit.

- a. True
- b. False

ANSWER: True

157.
The umbra of the Moon's shadow is the region from which no part of the photosphere is visible.

- a. True
- b. False

ANSWER: True

158.
The Moon and visible planets are always within a few degrees of the ecliptic.

- a. True
- b. False

ANSWER: True

159.
Precession of the Earth's axis causes the date at which perihelion of the Earth's orbit occurs to slowly change.

- a. True
- b. False

ANSWER: True

160.
Polaris has always been the star nearest the north celestial pole.

- a. True
- b. False

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ANSWER: False

161.

The seasons are caused by the precession of the Earth's axis.

- a. True
- b. False

ANSWER: False

162.

A lunar eclipse can only occur during the full phase of the Moon, i. e. when the Moon is full.

- a. True
- b. False

ANSWER: True

163.

Describe the path that a star on the celestial equator follows from the time it rises until it sets, a) for a person at a latitude of 60° North, and b) for a person at the equator.

ANSWER: Answer not provided.

164.

Describe the location of Polaris in the sky relative to the horizon as seen by observers in Yukon (lat. = 60° N), Texas (lat. = 33° N), Ecuador (lat. = 0°), and Australia (lat. = 30° S)

ANSWER: Answer not provided.

165.

What information does a star's Greek-letter designation convey?

ANSWER: Answer not provided.

166.

What advantage is there in referring to a star by its Greek-letter designation and constellation name rather using its traditional name?

ANSWER: Answer not provided.

167.

How are the celestial poles and equator defined by the Earth's rotation?

ANSWER: Answer not provided.

168.

How is a constellation different from an asterism?

ANSWER: Answer not provided.

169.

Why does the Moon glow coppery red during a total lunar eclipse?

ANSWER: Answer not provided.

170.

Why have more people seen total lunar eclipses than total solar eclipses?

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ANSWER: Answer not provided.

171.

Why don't eclipses occur at every new Moon and full Moon?

ANSWER: Answer not provided.

172.

What would you see if you were on the Moon and facing the Earth when people on the Earth saw a total lunar eclipse?

ANSWER: Answer not provided.

173.

Why does one cycle of lunar phases take 29. 53 days, even though the Moon orbits the Earth in 27. 32 days?

ANSWER: Answer not provided.

174.

Why are penumbral eclipses less obvious than partial eclipses?

ANSWER: Answer not provided.

175.

Describe how a small change in the relative distance of the Earth from the Sun at perihelion could affect the formation of glaciers on Earth.

ANSWER: Answer not provided.

176.

Why isn't the winter solstice the coldest day of the year?

ANSWER: Answer not provided.

177.

Give two reasons why summer days are warmer than winter days.

ANSWER: Answer not provided.

178.

Why can neither Venus nor Mercury remain visible throughout the night as the full Moon does?

ANSWER: Answer not provided.

179.

What causes precession, and why does it move the celestial equator?

ANSWER: Answer not provided.

180.

Explain why people who live close to the equator do not experience major temperature changes in the seasons.

ANSWER: Answer not provided.

181.

The Earth is closest to the Sun during the month of January. Yet we do not experience our hottest weather in January. Explain why not.

ANSWER: Answer not provided.

Name _____ Class _____ Date _____
: _____ : _____ e: _____

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