Exercise A5: The Celestial Sphere

Student name: _____ Class: _____ Date: _____

Check the box with the correct answer.

Question 1: Which of the following constellations does the celestial equator not pass through? Hint: Click anywhere in the main window and press “k” on your keyboard to toggle the constellations on/off.

- ☐ **a.** Cetus
- ☐ **b.** Orion
- ☐ **c.** Ursa Major
- ☐ **d.** Aquarius

Question 2: Where would the celestial equator appear to be located for an observer standing directly on one of the Earth’s poles? Hint: Change your location on the Earth to the North Pole.

- ☐ **a.** Directly overhead at the zenith.
- ☐ **b.** Parallel to the horizon.
- ☐ **c.** Between the zenith and the horizon.
- ☐ **d.** The celestial equator would not be visible.

Question 3: The relatively bright star near the north celestial pole is:

- ☐ **a.** Kochab
- ☐ **b.** Capella
- ☐ **c.** Dubhe
- ☐ **d.** Polaris

Question 4: An observer looking toward Polaris is always facing in what direction?

- ☐ **a.** South
- ☐ **b.** North
- ☐ **c.** Northeast
- ☐ **d.** Northwest

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Question 5: How does the altitude of the north celestial pole relate to the observer's geographical latitude on the surface of the Earth?

- ☐ **a.** The altitude of the NCP is equal to 180° minus the observer's latitude.
- ☐ **b.** In the southern hemisphere the NCP is seen in the observer's daytime sky.
- ☐ **c.** The altitude of the NCP is equivalent to the observer's geographic latitude.
- ☐ **d.** The altitude of the NCP is only equal to the observer's latitude at midnight.

Question 6: The ecliptic is inclined 23.5 degrees with respect to the celestial equator. This is the result of:

- ☐ **a.** The tilt of Earth's rotational axis.
- ☐ **b.** Earth's circular orbit.
- ☐ **c.** Earth's elliptical orbit.
- ☐ **d.** The gravitational pull of Polaris.

Question 7: On what dates does the Sun's position coincide with positions of the Vernal and Autumnal Equinox points respectively?

- ☐ **a.** December 21 and September 23
- ☐ **b.** December 21 and June 21
- ☐ **c.** March 21 and June 21
- ☐ **d.** March 20 and September 22

Question 8: On what dates does the Sun reach the most northerly and southerly points along the ecliptic (the summer and winter solstices) respectively?

- ☐ **a.** December 21 and September 23
- ☐ **b.** June 21 and December 21
- ☐ **c.** March 21 and June 21
- ☐ **d.** March 21 and September 21

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Question 9: What is the maximum angular distance from the celestial equator that the Sun can reach?

- ☐ **a.** 23.5°
- ☐ **b.** 90°
- ☐ **c.** 0°
- ☐ **d.** 113.5°