ROMANO

Earth Motions Practice Worksheet #2 – ANSWERS AND EXPLANATIONS

1. (1) – Earth's revolution is 365 ¼ days – after four years we add up the 4 quarters and tack on a day at the end of February.

2. (4) – The Earth's North Pole is tilted away from the Sun's rays that are coming in from the right side of the diagram.

3. (3) – We are looking at the Earth from North Polar view. Point X is on the fringe of light and dark and rotating into the darkness. This is what happens at sunset. The best "sunset" time given is 6pm. In this diagram, 12 noon would be on the right side of the Earth directly facing the Sun's rays, and midnight would be on the left just opposite 12 noon. The fringe on the bottom rotating into the light would represent sunrise (approx. 6am)

4. (3) – The Foucault pendulum is the best evidence that the Earth rotates. The pendulum appears to change direction because the Earth is rotating underneath it. Since the rate and direction of rotation of the Earth is predictable, so it's the apparent motion of the pendulum.

5. (3) – Earth's rate of rotation is 15^{o}/hr. 12 hours x 15^{o}/hr = 180^{o}.

6. (2) – The Earth rotates from west to east – it doesn't matter which hemisphere you are in – the Sun will always appear to rise in the east and set in the west. DO NOT confuse with the fact that the Northern and Southern Hemispheres have opposite seasons.

7. (1) – Star trails (stars appear to make circular paths around Polaris) are a result of Earth rotating.

8. (4) – The Coriolis Effect (deflection of winds and ocean currents) is caused by Earth's rotation. (remember our demo in class drawing on the globe …)

9. (4) – The diagram represents June 21st or the summer season in the Northern Hemisphere. (Earth's North Pole is tilted toward the Sun's rays) Since it is June 21st , the only true statement in the choices given is that it represents the date with the most daylight hours.

10. (3) – The heliocentric (Sun-centered Solar System model) provides a more accurate explanation of the motions of planets. It corrected the idea of an "epicycle" which was a more elaborate (and totally incorrect) explanation of how planets orbit.

11. (1) – Perihelion means that the Earth is closest to the Sun. Position A is where the Earth is closest to the Sun.

12. (3) – To get from point A to B, the Earth would have to revolve. The rate of Earth's revolution is approximately 1^{o}/day.

13. (3) – June 21st is summer in the Northern Hemisphere. This occurs when the Earth is farthest away from the Sun as it is at position C.

14. (1) – The reason why we see different constellations in different seasons is because the Earth is in a different position in the Solar System as it is revolving. We can see certain stars when we are on one side of the Solar System, and other stars when we revolve to the other side of the Solar System.

15. (1) – A pendulum would appear to change direction because a planet rotates. Since planet X does not rotate, the pendulum would not appear to change direction.

16. (1) – As shown by the diagram, on June 21st the North Pole is tilted toward the Sun.

17. (3) – Aphelion is the time when the Earth is farthest from the Sun. Position A in the diagram looks the farthest. Also, position A represents summer in the northern hemisphere – the time when the Earth is farthest from the Sun (aphelion actually occurs on or near July 4th)

18. (4) – Positions A and C represent the summer and winter solstices (the times where the Earth is tilted towards or away from the Sun). Position B is the autumnal equinox and position D is the vernal equinox. Remember: in these diagrams, summer and winter will always be plotted on the left and right – making the other two positions the equinoxes

19. (1) – The diagram indicates summer in the northern hemisphere and winter in the southern hemisphere. If the Earth were to complete one rotation as shown, the South Pole would never rotate into daylight.

20. (2) – During the time span between September and November the daylight hours slowly decrease. Just think of what you notice from the beginning of school till now. None of the other combinations cause a continuous decrease. From March 1 to May 1 the daylight hours continually increase. From June 1 to August 1 the daylight hours increase till June 21st and then decrease thereafter. From December 1 to February 1 the hours decrease till December 21st and then increase thereafter.