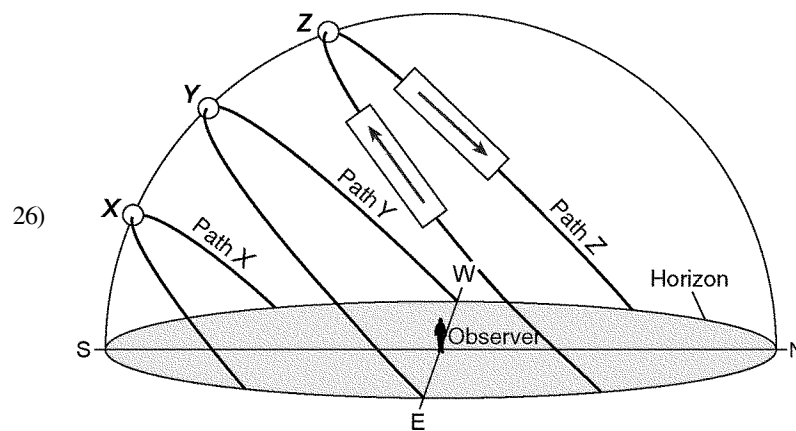


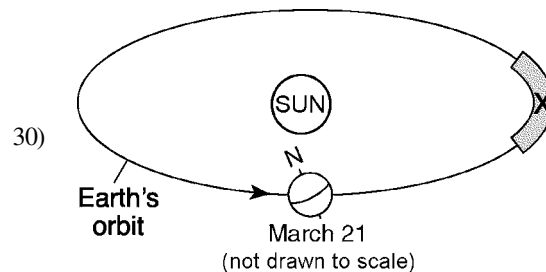
- 1) A 2) D 3) C 4) B 5) B
 6) A 7) C 8) D 9) B 10) A
 11) A 12) C 13) D 14) A 15) C
 16) B 17) D 18) A 19) D 20) B
 21) C 22) B

- 23) **SAMPLE ANSWERS:** The 90°-angle plate received more intense radiation. **OR** It received the most concentrated/more direct rays. **OR** It absorbed the most light. **OR** It reflected the least amount of light.
- 24) **SAMPLE ANSWERS:** Final temperatures would be lower. **OR** cooler; **SAMPLE EXPLANATIONS:** More light is reflected off the white surface. **OR** Less energy is absorbed by the white surface. **OR** Black absorbs energy better.
- 25) 0° latitude **OR** the equator



- 26) **SAMPLE ANSWERS:**
Path X: Dec. 20 or Dec. 21 or Dec. 22 **OR** winter solstice **OR** first day of winter;
Path Y: March 20 or March 21 or March 22 **OR** Sept. 21 or Sept. 22 or Sept. 23 **OR** autumnal equinox or fall equinox **OR** vernal equinox or spring equinox **OR** an equinox **OR** first day of spring or first day of fall;
Path Z: June 20 or June 21 or June 22 **OR** summer solstice **OR** first day of summer

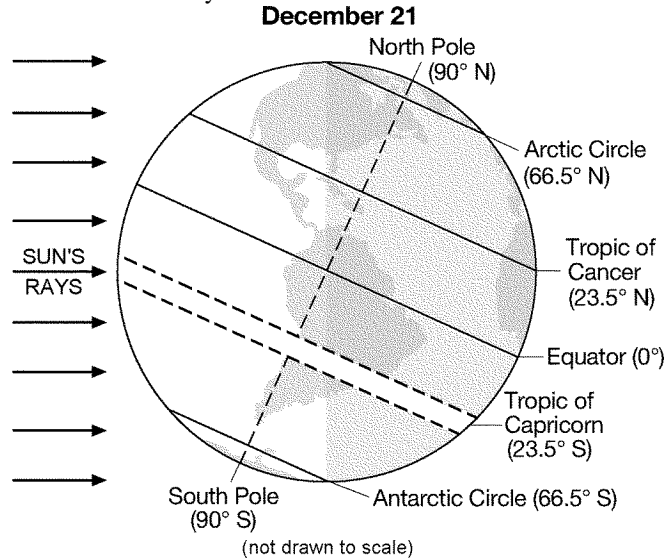
- 27) 15D/h
- 28) **SAMPLE ANSWERS:** *Polaris* is not overhead. **OR** All compass directions are shown. **OR** The Sun's path is tilted. **OR** At the North Pole, the altitude of *Polaris* is 90D.



- 29) **SAMPLE ANSWERS:** parallelism of Earth's axis **OR** The North Pole always points toward *Polaris*. **OR** revolution of Earth **OR** location of the Sun's vertical ray **OR** duration/intensity of insolation **OR** angle of insolation
- 30) 12 h

33) summer

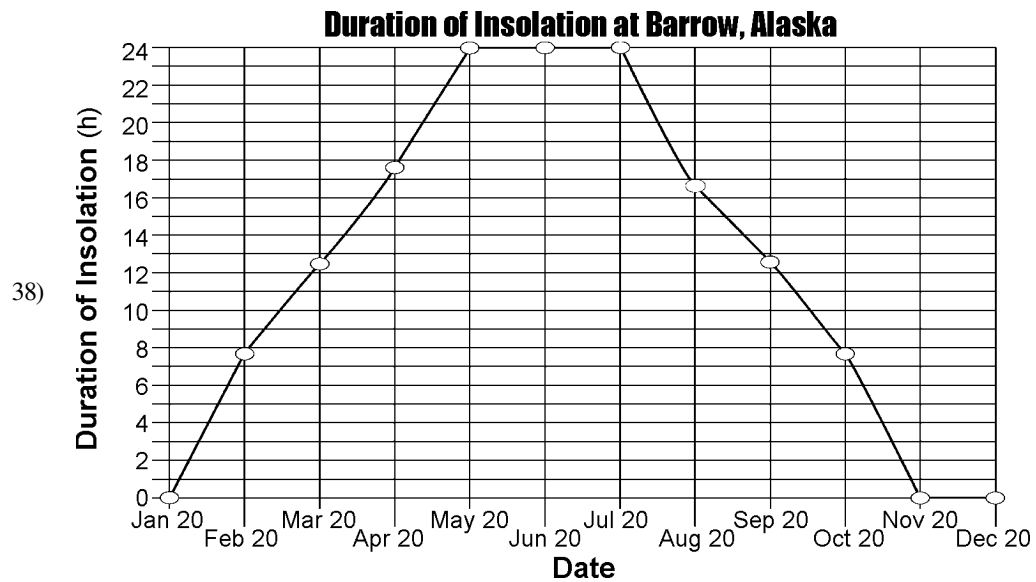
34) Center of the X anywhere between the dashed lines at the Tropic of Capricorn (23.5°S)



35) SAMPLE ANSWERS: 66.5°N OR $66\frac{1}{2}^{\circ}$ N OR 66°30'N OR at the Arctic Circle

36) 12 h

37) A

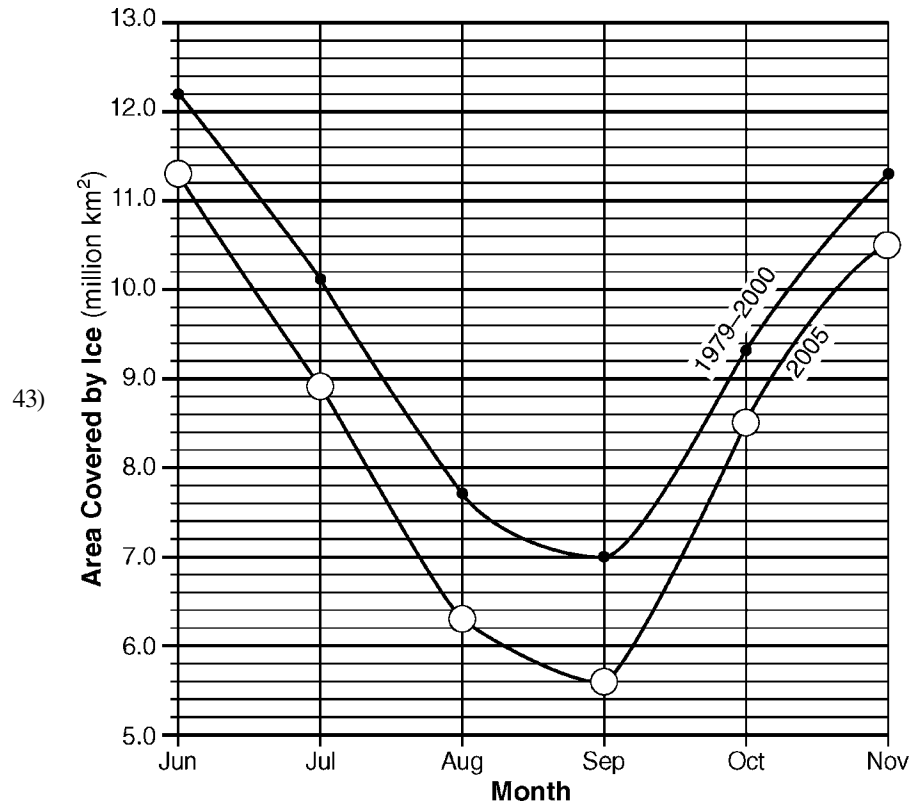


39) SAMPLE ANSWERS: During one Earth rotation on December 20, Barrow remains on the nighttime side of Earth. OR The Northern Hemisphere is tilted away from the Sun. OR Barrow is north of the Arctic Circle.

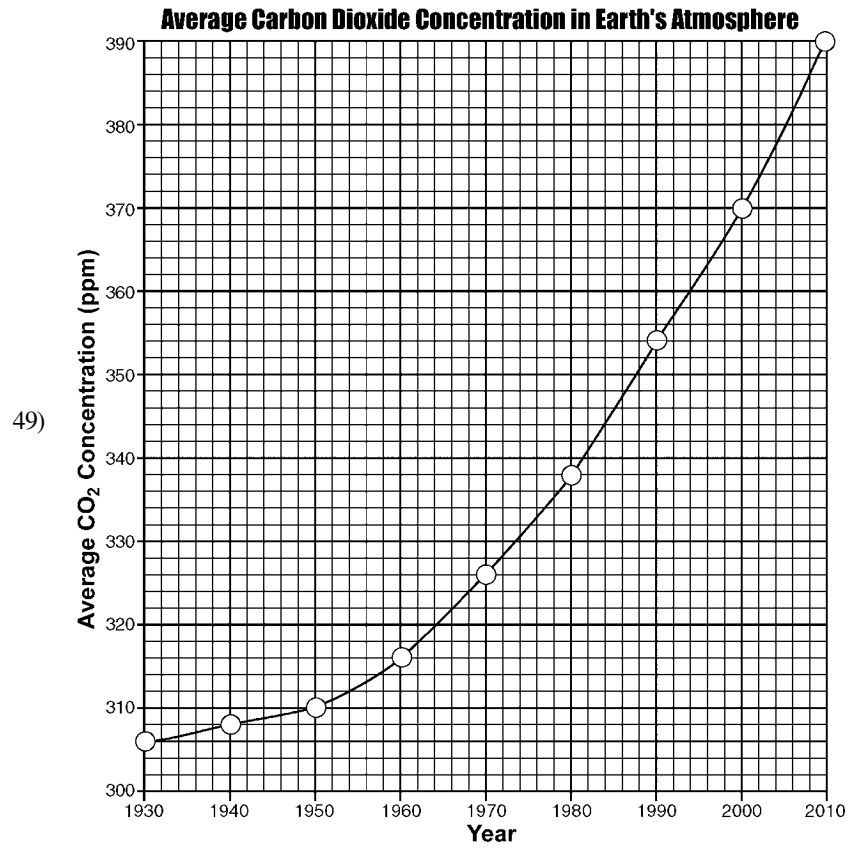
40) 71D

41) SAMPLE ANSWERS: Barrow is approximately 80D west of OR Barrow's longitude is different from New York City. OR Earth rotates from west to east, so the Sun rises later in Barrow.

42) SAMPLE ANSWERS: June 20 OR June 21 OR June 22



- 44) SAMPLE ANSWERS: The area covered by ice in 2005 was less than the average area covered by ice from 1979 to 2000. OR The area covered by ice was less, showing evidence of global warming. OR More ice melted in 2005 than the average that melted from 1979 to 2000. OR The ice caps were melting, causing less surface ice in 2005. OR There was less ice in 2005.
- 45) SAMPLE ANSWERS: carbon dioxide (CO₂) OR methane (CH₄) OR water vapor (H₂O gas) OR nitrous oxide (N₂O) OR ozone (O₃) OR chlorofluorocarbons (CFCs)
- 46) SAMPLE ANSWERS: methane (CH₄) OR water vapor (H₂O) OR nitrous oxide (N₂O) OR ozone (O₃) OR chlorofluorocarbons (CFCs)
- 47) SAMPLE ANSWERS: methane OR water vapor OR carbon dioxide (CO₂) OR ozone
- 48) SAMPLE ANSWERS: Greenhouse gases absorb the longer wave radiation coming from Earth's surface. OR Greenhouse gases trap the heat given off by Earth. OR Greenhouse gases absorb infrared energy.



50) 2 ppm/y