

Introductory Astronomy

Homework 17: Pluto, Kuiper Belt, Oort Cloud, and Comets Not to be handed in. Homework solutions are posted already.

033 qmult 00100 1 4 4 easy deducto-memory: Herschel Uranus

1. "Let's play *Jeopardy!* For \$100, the answer is: He/she discovered the planet Uranus."

Who is _____, Alex?

- a) Nicolaus Copernicus (1473–1543) b) Galileo Galilei (1564–1642) c) Isaac Newton (1642/3–1727) d) William Herschel (1738–1822) e) Caroline Lucretia Herschel (1750–1848).

SUGGESTED ANSWER: (d)

Wrong answers:

- c) Newton was born 1642dec25 on the Julian calendar used in England all of this life. This 1643jan04 on the modern Gregorian calendar that was used in most of the rest of Europe at that time.
e) She was probably nearby making coffee or something.

Redaction: Jeffery, 2001jan01

033 qmult 00300 1 4 4 easy deducto-memory: Pluto discovery

2. Pluto was discovered on 1930 February 18 by:

- a) Percival Lowell (1855–1916). b) Henrietta Swan Leavitt (1868–1921). c) Edwin Hubble (1889–1953). d) Clyde Tombaugh (1906–1997). e) Fred Hoyle (1915–2001).

SUGGESTED ANSWER: (d)

Wrong answers:

- a) Lowell initiate the search that resulted in the discovery Pluto. This answer can be ruled out, unless the dead walk.
b) Another spectral discoverer.

Redaction: Jeffery, 2001jan01

033 qmult 00310 1 4 1 easy deducto-memory: blink comparison

3. The actual method of Pluto's discovery was:

- a) blink comparison of sky photographs taken at different times. b) radar ranging. c) just visual searching of the sky. d) by X-ray observations. e) by psychic power.

SUGGESTED ANSWER: (a)

Wrong answers:

- e) As Lurch would say: "Aaaarh."

Redaction: Jeffery, 2001jan01

033 qmult 00320 2 4 2 moderate deducto-memory: Charon discovery

4. Pluto's moon, discovered 1978 July 2 by James Christy of the U.S. Naval Observatory, is called:

- a) Sedna. b) Charon. c) Persephone. d) Dante. e) Virgil.

SUGGESTED ANSWER: (b) See FMW-238.

Wrong answers:

- c) Persephone was Pluto's wife: to be consistent one should use her Roman identity Proserpina.
 e) As Lurch would say: "Aaaarh."

Redaction: Jeffery, 2001jan01

033 qmult 00390 1 1 5 easy deducto-memory: Pluto's planet status

5. Pluto's status is disputable because it is:

- a) too far from the Sun. b) too close to the Sun. c) not a gas giant. d) a gas giant.
 e) probably just a very large Kuiper Belt object. Comparable or larger Kuiper Belt objects may be discovered.

SUGGESTED ANSWER: (e) This is a best answer, but not a complete answer. It also obeys the longest-answer-is-right rule.

Wrong answers:

- c) I don't think anyone could accept this.
 d) As Lurch would say: "Aaaarh."

Redaction: Jeffery, 2001jan01

033 qmult 01100 1 4 5 easy deducto-memory: icy body reservoirs

6. The solar system seems to have two reservoirs of icy bodies from which comets originate:

- a) Valles Marineris and Olympus Mons. b) Phobos and Deimos. c) Ishtar Terra and Aphrodite Terra.
 d) the Asteroid Belt and the rings of Saturn. e) the Kuiper Belt and the Oort Cloud.

SUGGESTED ANSWER: (e)

Wrong answers:

- a) Big fracture canyon and volcano on Mars
 b) The two Martian moons.
 c) Highlands on Venus. See Se-470
 d) The Asteroid Belt has rocky planetesimal fragments and perhaps a few whole planetesimals maybe. The rings of Saturn are ice particles mainly. See Se-516

Redaction: Jeffery, 2001jan01

033 qmult 01500 1 4 1 easy deducto-memory: Sedna

7. "Let's play *Jeopardy!* For \$100, the answer is: This trans-Neptunian object is named for the Inuit goddess of the underworld sea, aquatic mammals, and the dead."

- a) What is _____, Alex?
 a) Sedna, discovered in 2003nov b) Quaoar, discovered in 2002 c) 1950 DA (asteroid 29075), discovered in 1950 d) Pluto's moon Charon, discovered in 1978 e) Alpha Centauri, discovered in 1996

SUGGESTED ANSWER: (a) Sedna may be of order 1500 km in diameter or maybe it is only 1000 km in diameter. See David Jewitt's Kuiper Belt site at

<http://www.ifa.hawaii.edu/faculty/jewitt/kb.html>.

Sedna is probably not a Kuiper Belt object (KBO), but Jewitt will probably count it anyway. The KBO DW 2004 is probably smaller than Sedna, but maybe not.

Wrong answers:

- b) Quaoar (pronounced kwah-o-wahr) is named for a Native American god of California who sings and dances the other gods into existence.
- c) This asteroid is only about 1.1 km in diameter, but there is perhaps 1 chance in 300 that it will hit the Earth—in 2880. The 1950 DA is provisional and just denotes the time of discovery.
- d) Charon is named for ferryman for the River Styx: on the far shore is the underworld—the kingdom of Pluto.
- e) Alpha Centauri is a star. The Jupiter 2 with the Robinson family launched off to there in 1996 according to the 1960's "classic" TV show.

Redaction: Jeffery, 2001jan01