

Introductory Astronomy**NAME:**

Homework 0: A Philosophical and Historical Introduction to Astronomy: Homeworks and solutions are posted on the course web site. Homeworks are not handed in and not marked. But many homework problems (~ 50–70 %) will turn up on exams.

001 qmult 00007 1 4 1 easy deducto-memory: reading-homework-self-testing done 2

- Did you complete reading-homework-self-testing for the Introductory Astronomy Lecture (IAL) by the weekly due date?
 - YYYessss!
 - Jawohl!
 - Da!
 - Sí, sí.
 - OMG no!

SUGGESTED ANSWER: (a),(b),(c),(d)

Wrong answers:

- As Lurch would say AAAARGH.

Redaction: Jeffery, 2008jan01

000 qmult 00100 1 1 2 easy memory: philosophical/historical/poetical intro

- It is somewhat traditional or at least not unusual to begin a book or course on _____ with a philosophical/historical/poetical statement.
 - agronomy
 - astronomy
 - metallurgy
 - proctology
 - tautology

SUGGESTED ANSWER: (b)

Wrong answers:

- Proctology is a very important science—but not one that can be discussed in polite society.

Redaction: Jeffery, 2008jan01

000 qmult 00200 1 4 5 easy deducto-memory: science partially defined

- “Let’s play *Jeopardy!* For \$100, the answer is: An activity that involves a study of objective reality and the scientific method.”

What is _____, Alex?

 - accounting
 - poetry
 - home repair
 - homework
 - science

SUGGESTED ANSWER: (e)

Wrong answers:

- As Lurch would say AAAARGH.

Redaction: Jeffery, 2008jan01

000 qmult 00210 1 1 2 easy memory: scientific method described

Extra keywords: physci KB-24-1 but much altered

- The scientific method can be schematically described as a/an:
 - hypothesis of theorizing and experiment/observation.
 - cycle of theorizing and experiment/observation.
 - reductive process.
 - integrative process.
 - cycle of experiment and observation.

SUGGESTED ANSWER: (b)

Wrong answers:

- Say what?
- Say what?
- As Lurch would say: “Aaaarh.”

Redaction: Jeffery, 2001jan01

000 qmult 00240 1 1 3 easy memory: science progressive

- Most people would agree that science is:
 - digressive.
 - regressive.
 - progressive.
 - impressive.
 - depressive.

SUGGESTED ANSWER: (c)

Wrong answers:

- d) True, but not the best answer.

Redaction: Jeffery, 2008jan01

000 qmult 00242 1 4 5 easy deducto-memory: art defined sort of

Extra keywords: physci

6. “Let’s play *Jeopardy!* For \$100, the answer is: To give an inadequate, but arguably useful, definition: A human pursuit which has no absolute standard (although personal or local standards are common and probably essential) that, among other things, tries to extend human understanding and to give pleasure, sometimes of a very qualified sort.”

What is _____, Alex?

- a) a science b) nonsense c) geology d) of no conceivable use e) an art

SUGGESTED ANSWER: (e)

Wrong answers:

- a) This is as exactly wrong as a sort of philosophical question will admit of.

Redaction: Jeffery, 2001jan01

000 qmult 00400 1 4 3 easy deducto-memory: physics defined partially

Extra keywords: physci

7. Physics can be briefly defined as the science of:

- a) human relations. b) sports and leisure. c) matter and motion. d) matter and rest.
e) light.

SUGGESTED ANSWER: (c)

Wrong answers:

- b) As Lurch would say: “Aaaarh.”
e) Light is only part of physics. Matter and motion is more descriptive, but not totally descriptive.

Redaction: Jeffery, 2001jan01

000 qmult 00410 1 4 2 easy deducto-memory: fundamental physics

8. “Let’s play *Jeopardy!* For \$100, the answer is: It is the branch of physics that is the search for very general laws and very general results (which are derived from those general laws). The general laws and results are always (or almost always) expressible as mathematical formulae.”

What is _____, Alex?

- a) applied physics b) fundamental physics c) astronomy d) low-temperature physics
e) geophysics

SUGGESTED ANSWER: (b)

Wrong answers:

- a) As Lurch would say AAAARGH.

Redaction: Jeffery, 2008jan01

000 qmult 00412 1 4 4 easy deducto-memory: fundamental in physics

Extra keywords: physci

9. “Let’s play *Jeopardy!* For \$100, the answer is: ‘Just so’ in physics.”

What is _____, Alex?

- a) a story by Rudyard Kipling b) essential c) eternal d) fundamental e) infernal

SUGGESTED ANSWER: (d)

Wrong answers:

- a) There are several *Just So Stories*, but none of them is the best answer in this context.

Redaction: Jeffery, 2001jan01

000 qmult 00420 1 4 2 easy deducto-memory: applied physics astronomy

Extra keywords: physci

10. Astronomy includes both _____ and fundamental physics.
- a) psychology. b) applied physics. c) other than physics. d) fundamental physics.
e) indifferent physics.

SUGGESTED ANSWER: (b)

Wrong answers:

- d) Exactly wrong.
e) As Lurch would say: “Aaaarh.”

Redaction: Jeffery, 2001jan01

000 qmult 00520 1 4 2 easy deducto-memory: emergent theory

11. “Let’s play *Jeopardy!* For \$100, the answer is: In the opinion of the instuctor, it is any important theory that applies to reality in some form. Such theories are in some sense and to some degree independent of other theories including the true fundamental theory of physics. They emerge from reality and are like Platonic ideals. Another view is that it is a theory that applies to a complex system but not to that system’s components. It emerges from the complexity. The two views arn’t all that far apart if you define complexity broadly enough.”

What is a/an _____ theory, Alex?

- a) convergent b) emergent c) divergent d) specious e) faux

SUGGESTED ANSWER: (b)

Wrong answers:

- a) As Lurch would say AAAARGH.

Redaction: Jeffery, 2008jan01

000 qmult 00560 2 4 2 moderate deducto memory: genetic algorithm

12. Evolution by survival of the fittest is used in computer calculations to find optimum solutions to problems where the solutions are treated as breeding entities. The best known of such techniques is called the:
- a) genetic methodology. b) genetic algorithm method. c) Darwin algorithm method.
d) no-name method. e) evolution method.

SUGGESTED ANSWER: (b)

Wrong answers:

- c) This is what Marilyn Monroe and Marlon Brando used.
e) As Lurch would say: “Aaaarh.”

Redaction: Jeffery, 2001jan01

000 qmult 00570 2 4 1 moderate deducto-memory: 2nd law a pan-universal theory

13. In the multiverse paradigm, it is posited that the 2nd law of thermodynamics must _____ absolutely everywhere in the multiverse—in all the pocket universes and all the regions between them—even though the multiverse outside our pocket universe may have different physics in most respects from our pocket universe.

- a) hold b) not hold c) be impossible d) be infernal e) be notorious

SUGGESTED ANSWER: (a)

The 2nd law seems to be an inescapable theory for any complex system with random processes. It is also independent of the underlying fundamental particle physics and should apply in realms of reality with quite different fundamental particle physics than our own realm.

By the by, in the multiverse paradigm, it usual to hypothesize that high-energy quantum field theory is the same throughout the multiverse or else we can't extrapolate our theories at all to the multiverse, and thus can't say anything at all about the multiverse.

Wrong answers:

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

Redaction: Jeffery, 2001jan01

000 qmult 00600 1 4 3 easy deducto-memory: Bayesian analysis

14. "Let's play *Jeopardy!* For \$100, the answer is: It a technique in statistics for dealing of the probability of truth of theories to your knowledge. It could be called the scientific method quantified."

What is _____, Alex?

- a) Bayes' theorem b) Occam's theorem c) Bayesian analysis d) Occam's razor
e) Bayes' axiom

SUGGESTED ANSWER: (c)

Wrong answers:

- a) This is the basic theorem of Bayesian analysis.

Redaction: Jeffery, 2008jan01

000 qmult 00700 1 1 2 easy memory: aphorism for anthropic principle

15. The aphorism "Things have to be the way they are or we would not have a chance of being here to observe them." loosely summarizes:

- a) the cosmological principle. b) the anthropic principle. c) Bayesian analysis.
d) the fundamental principle. e) falsifiability.

SUGGESTED ANSWER: (b)

Wrong answers:

- a) A nonsense answer.

Redaction: Jeffery, 2008jan01

000 qmult 00820 1 1 4 easy memory: astronomy applied and fundamental physics

16. Astronomy can be considered both applied physics (since it uses all branches of physics) and fundamental physics since it includes:

- a) psychology. b) biology. c) cosmetology. d) cosmology. e) nuclear physics.

SUGGESTED ANSWER: (d)

Wrong answers:

- d) As Lurch would say AAAAAaargh.

Redaction: Jeffery, 2008jan01

000 qmult 00920 1 1 2 easy memory: physical science defined

Extra keywords: physci

17. A physical science can be defined as:

- a) an art form. b) a science that depends strongly on physics. c) a science that does not depend on physics at all. d) a science that is identical with fundamental physics.
e) a pointless pursuit.

SUGGESTED ANSWER: (b)

Wrong answers:

- d) No.
e) As Lurch would say: "Aaaarh."

Redaction: Jeffery, 2001jan01

000 qmult 00922 1 4 3 easy deducto-memory: example physical sciences

Extra keywords: physci

18. The following are usually considered physical sciences:

- a) proctology, theosophy, and Deuteronomy. b) proctology, immunology, and biology.
c) chemistry, geology, and meteorology. d) proctology, geology, and biology.
e) chemistry, geology, and biology.

SUGGESTED ANSWER: (c)

Wrong answers:

- a) As Lurch would say: “Aaaarh.”
d) Proctology is a very important science—but not one that can be discussed in polite society.

Redaction: Jeffery, 2001jan01

000 qmult 01000 1 1 3 easy memory: astronomy defined

19. In the broadest sense, _____ is the study of all extraterrestrial phenomena and also terrestrial phenomena that fall into the same categories as extraterrestrial phenomena.

- a) agronomy b) antimony c) astronomy d) antiquity e) antigone

SUGGESTED ANSWER: (c)

Wrong answers:

- e) Antigone: heroine of Thebes.

Redaction: Jeffery, 2008jan01

000 qmult 01050 1 1 1 easy memory: astronomy oldest empirical science

20. Although one can quibble, most would agree that astronomy is the best candidate for being:

- a) the oldest empirical science. b) the newest empirical science. c) of little interest.
d) the same as astrology. e) the queen of the sciences.

SUGGESTED ANSWER: (a)

Wrong answers:

- e) This has generally been conceded too. It has always been the royal science. But I’m not accepting it as a best answer since it is just metaphorical.

Redaction: Jeffery, 2008jan01