

Phys107 HW#01

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Solutions to Chapter 1 Exercises

2. (a) This is a scientific hypothesis, for there is a test for wrongness. For example, you can extract chlorophyll from grass and note its color. (b) This statement is without a means of proving it wrong and is not a scientific hypothesis. It is speculation. (c) This is a scientific hypothesis. It could be proved wrong, for example, by showing tides that do not correspond to the position of the Moon.

6. The Sun's radius is approximately 7×10^8 m. The distance between the Earth and Moon is about 4×10^8 m. So the Sun's radius is much larger, nearly twice the distance between the Earth and Moon. The Earth and Moon at their present distance from each other would easily fit inside the Sun. The Sun is *really* bigsurprisingly big!

9. What is likely being misunderstood is the distinction between theory and hypothesis. In common usage, "theory" may mean a guess or hypothesis, something that is tentative or speculative. But in science a theory is a synthesis of a large body of validated information (e.g., cell theory or quantum theory). The value of a theory is its usefulness (not its truth).

10. Yes, for many examples abound in such areas as music, architecture, painting, poetry, and even an eloquent thought. This list is nearly endless.