HW4

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Started: February 12, 2006 11:15 AM | 10 Questions

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1. Mars or Venus

(20 point(s))

You want to move to either Mars or Venus (don't ask me why). You are basing your decision on which planet has the most Earth-like gravity. Calculate your weight on both planets as a percentage of your Earth weight. Which one do you choose?

$R_{Mars} = 0.53\ R_{Earth}$
$M_{Mars} = 0.11\ M_{Earth}$

$R_{Venus} = 0.95\ R_{Earth}$
$M_{Venus} = 0.81\ M_{Earth}$

Save Answer

2. Dumm color blind?

(10 point(s))

You are out late at night, after a particularly bad party. You and your friend Dumm are laying on the hood of your car. Dumm looks up and says, "Isn't it funny how all the stars are the same color?" What do you say?

Save Answer

3. Mircrowave Oven

(14 point(s))

A microwave oven typically operates at a frequency of 2.45 GHz (1 GHz = 10^9 Hz). What is the wavelength of the microwaves in your oven? Compare this wavelength to the size of a slice of pizza.

Save Answer

4. Radio Speed

(8 point(s))

Radio waves travel through space at what speed?

- 1. faster than the speed of light, since their wavelength is longer
- 2. much faster than the speed of light
- 3. slower than the speed of light , since their wavelength is longer
- 4. at the speed of light, 3×10^8 m/s

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5. Peak Emission

(8 point(s))

As a newly formed star is born, its temperature increases. What happens to the peak wavelength of its emitted light?

- 1. It moves toward shorter wavelengths (e.g., IR to visible).
- 2. It moves toward longer wavelengths (e.g., visible to IR).
- 3. It does not change, since it does not depend on temperature.
- 4. It does not change, because any shift in color is absorbed by interstellar dust.

Save Answer

6. Temperature

(8 point(s))

The human eye has evolved over time so that its peak wavelength sensitivity is about 0.5 μm (1 μm = 10^{-6} m). Use Wien's law to calculate the temperature of blackbody radiation to which the eye is most sensitive.

- 1. 14,240 K
- 2. 0.58 K
- 3. 580 K
- 4. 5,800 K

5. 100,000 K

Save Answer

7. Brightness

(8 point(s))

The temperature of the surface of the Sun is 5800 K. What would be the surface temperature of a star that emits twice the energy flux (watts per square meter) that the Sun emits? Hint use, the Stefan-Boltzmann law.

1. 11,600 K

2. 8200 K

3. 6900 K

4. 4880 K

Save Answer

8. Spectrum of Sunlight.

(8 point(s))

The spectrum of sunlight, when spread out by a spectrograph, has what characteristic appearance?

1. series of separate emission lines, characteristic of many elements, that overlap in certain regions of the spectrum to produce short sections of continuous color

2. continuous band of color, crossed by innumerable emission lines

3. continuous band of color, crossed by innumerable dark absorption lines

4. continuous and uniform band of color from violet to deep red

Save Answer

9. Telescope Resoltion

(8 point(s))

The resolution of a telescope is best for which segment of the visible spectrum?

1. red

2. green

3. blue

4. Violet

5. The resolution is the same all across the visible spectrum.

Save Answer

10. Telescope

(8 point(s))

The main optical element in a reflecting telescope is a

1. lens.

2. mirror.

3. combination of many small lens.

4. prism of glass.

Save Answer

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