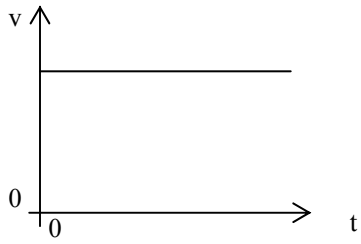
Name _____

CSET Sample Exam Questions

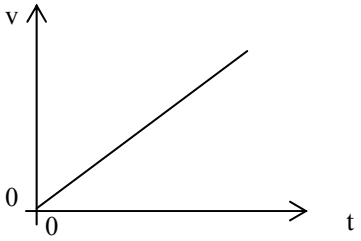
General Science I – Science Skills and Abilities

1. The Pacific Plate slides northward relative to the North American Plate continental plates at a constant rate of about 1cm/year. Which of the graphs below best represents the speed (v) of the plate versus time (t)?

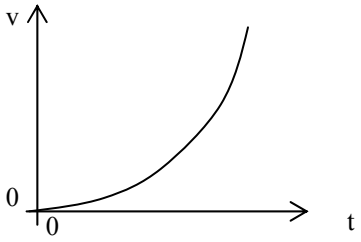
A.



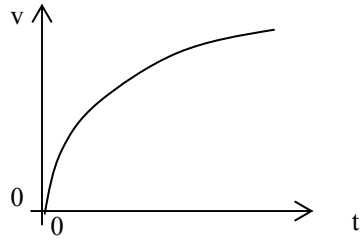
C.



B.



D.



2. You are using a metric ruler to measure the distance between two objects. If the ruler has a precision of 1 cm, which of the following best represents the uncertainty of this ruler?

   A. ± 0.25 cm

   B. ± 0.5 cm

   C. ± 1 cm

   D. ± 1.5 cm

Name _____

3. The following statements are examples of hypotheses. Which of these statements is the best example of a *scientific* hypothesis.

   A. An asteroid collision with the earth did not cause the extinction of the dinosaurs.

   B. The human body is constantly bombarded by Z-rays, a type of radiation that cannot be detected by current technologies.

   C. Plants will grow much better when given water every day.

   D. Life may exist on Mars.

4. Use the data table below to answer the questions that follow

Substance	Phase	Mass	Volume
1	Liquid	6 g	8 cm^3
2	Liquid	9 g	9 cm^3
3	Liquid	20 g	5 cm^3
4	Solid	5 g	4 cm^3
5	Solid	8 g	9 cm^3

The mass and volume of five substances are measured and recorded. Which of the following is a valid conclusion that can be drawn from the data above?

A. Substance 4 will float in Substance 2 when both are in the liquid phase.

B. Substance 4 will float in Substance 1

C. Substance 3, in solid form, will float in the liquid form of Substance 3.

D. Substance 5 will float in Substance 2.

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CSET Sample Exam ANSWERS

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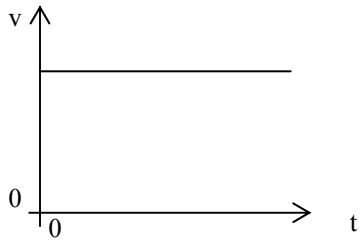
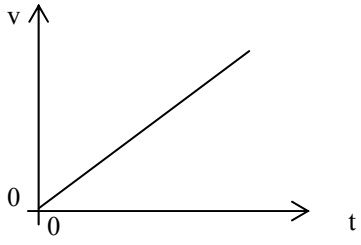
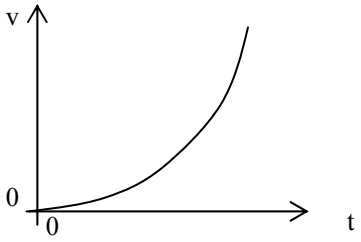
A.



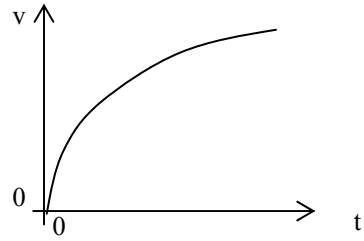
C.



B.



D.



The correct answer is A. The question states that the plates are moving relative to one another with a *constant* speed. All the graphs above depict the relationship between speed (v) and time (t). The only graph that depicts a constant speed over time is A. Graph C depicts the case where the velocity is constantly increasing as time goes by. Graphs Band D depict cases where the velocity is exponentially increasing (B) and exponentially decreasing (C).

2. You are using a metric ruler to measure the distance between two objects. If the ruler has a precision of 1 cm, which of the following best represents the uncertainty of this ruler?

   E. ± 0.25 cm

   F. ± 0.5 cm

   G. ± 1 cm

   H. ± 1.5 cm

The correct answer is B. The ruler has a precision of 1 cm. This means that the ruler is marked to the nearest 1 cm. There are no marks at all between the centimeter markings, so when you make a measurement with this ruler, you will need to round up or down to the nearest cm. This means the range of error associated with this ruler is also 1cm – or ±0.5 cm.

Name _____

3. The following statements are examples of hypotheses. Which of these statements is the best example of a *scientific* hypothesis.

   E. An asteroid collision with the earth did not cause the extinction of the dinosaurs.

   F. The human body is constantly bombarded by Z-rays, a type of radiation that cannot be detected by current technologies.

   G. Plants will grow much better when given water every day.

   H. Life may exist on Mars.

The correct answer is A. For a hypothesis to be considered scientific, it must be testable, able to be proven false, and stated clearly. Statement B is NOT a scientific hypothesis because it can not be tested (Z-rays can't be detected by current technologies). Statement C is not a scientific hypothesis because it is not stated clearly enough to be tested. What does it mean for plants to grow *much better*? Does this imply taller, greener, or bushier? Statement D is also stated in a way that is vague and difficult to test. To disprove this statement, one would have to test the entire planet – including the parts of the planet far beneath the surface. It would be better to state this hypothesis in a way that would be easier to test – for example, "life exists in the polar ice caps of Mars." Statement A is an example of a scientific hypothesis because is clear and can be falsified.

Name _____

4. Use the data table below to answer the questions that follow

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E. Substance 4 will float in Substance 2 when both are in the liquid phase.

F. Substance 4 will float in Substance 1

G. Substance 3, in solid form, will float in the liquid form of Substance 3.

H. Substance 5 will float in Substance 2.

The correct answer is D. In order to determine what substance will float in what liquid, we need to find a substance (either in liquid or solid form) whose density (mass/volume) *is less* than the density of any of the liquid substances. Substance 5 has a density of 8g/9cm^3 or 0.89 g/cm^3. Substance 2 (a liquid) has a density of 9g/9cm^3 or 1g/cm^3. So substance 5 will float in substance 2. Answer B is not correct because the density of substance 4 is greater than substance 1 – so substance 4 will sink. For answers A and C, you *can't* make the assumption that the densities given in the table will be the same for solid and liquid phases of the same substances. Because have not been given enough information to draw a valid conclusion about what might happen if substance 4 were liquid or substance 3 were liquid, these can not be the correct answers.