

EAS 100

Pre-Test

(For diagnostic and practice purposes only - Not for grade)

Name _____ Student ID# _____

Major _____ Semester in School _____

Last two science courses taken (subject and when taken) _____

Answer with short sentence or phrase or circle correct answer:

EXAMPLE (Do not answer): 0. List four observations that support the idea that the continents have "drifted" apart. Answer:

- a) fit of continental margins, b) fossils found in parts of continents of same age, c) evidence for spreading at midocean ridges (earthquakes, normal faults, volcanism), d) magnetic stripes and age of ocean floor, e) paleoclimate on matched parts of continent, f) convergent margins.

1. Metric system review:

a. 30 cm is about how many inches?

- (1) 6 in.
- (2) 12 in.
- (3) 36 in.
- (4) 92 in.

b. The temperature in Miami yesterday was about 82° Fahrenheit. What is this temperature on the Celsius scale?

- (1) 15°C
- (2) 22°C
- (3) 28°
- (4) 35°C

c. The distance from Lafayette to Indianapolis is about 60 miles. This distance is how many kilometers?

- (1) 40 km
- (2) 100 km
- (3) 150 km
- (4) 180 km

d. A person who weighs 165 pounds would weigh how much in kilograms?

- (1) 20 kg
- (2) 40 kg
- (3) 75 kg
- (4) 105 kg

e. What is a microgram?

- (1) 0.1 g
- (2) 0.001 g
- (3) 10^{-6} g
- (4) 10^{-9} g

2. Applied math and graph interpretation review:

a. The number 5×10^6 is equal to:

- (1) five thousand (5000)
- (2) five hundred thousand (500,000)
- (3) five million (5,000,000)
- (4) five billion (5,000,000,000)

b. To convert a velocity (speed) expressed in km/s to units of km/hr, one should:

- (1) multiply by 3600
- (2) multiply by 60
- (3) divide by 3600
- (4) divide by 60

c. A spacecraft is launched from Earth and travels at a constant velocity of 20,000 km/hr directly toward the moon which is 400,000 km from Earth. How long will it take for the spacecraft to get to the moon?

- (1) 10 hours
- (2) 0.05 hours
- (3) 20 hours
- (4) 200 hours

d. Examine the graph on the next page which shows dimensionless speed (speed divided by the square root of leg length times the acceleration of gravity) plotted versus relative stride length (length of step) for various animals walking or running. What is the approximate slope of the line shown on the graph?

- (1) 0.50
- (2) 0.75
- (3) 1.25
- (4) 2.00
- (5) 6.00

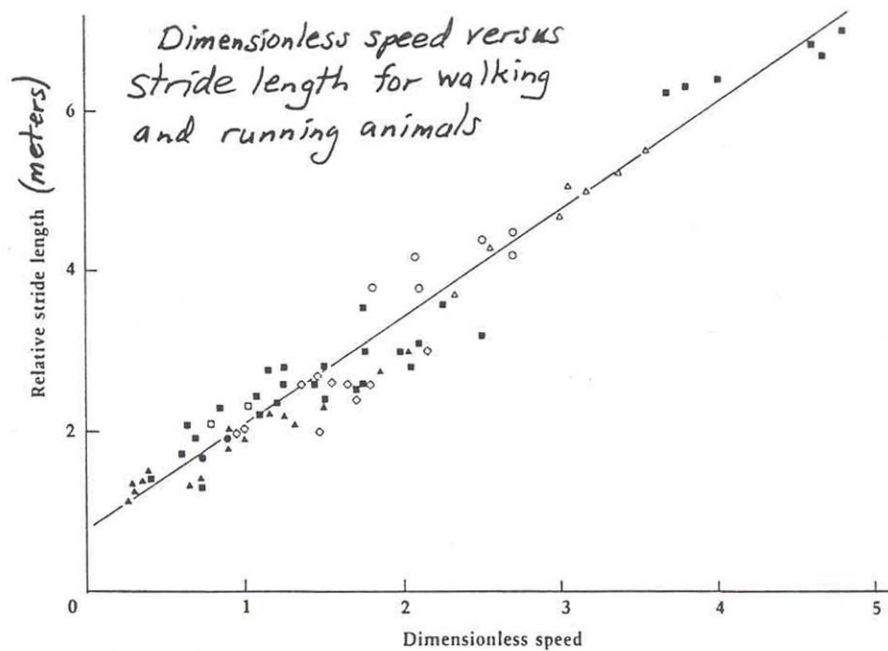


FIGURE 3.10. A graph of relative stride length against dimensionless speed for ostrich: (●), humans (○), dogs (■), elephant (□), rhinoceros (◇), sheep (△), and camels (▲). Data from Alexander 1976 and Alexander and Jayes 1983.

- e. We observe dinosaur footprints in a sandstone which indicate a stride length of 4 meters. Using the relationship on the graph, what is the estimated dimensionless speed of this dinosaur?
- (1) 1.0
 - (2) 2.5
 - (3) 4.0
 - (4) 0.5
 - (5) 6.0
3. We observe that the moon revolves around the earth approximately every 28 days. We also observe that we always see the same side of the moon from Earth. What does this imply about the rotation (about its axis) rate of the moon and the direction of its axis of rotation? (A sketch might help you answer this question).
4. What is the cause of seasons on Earth?

5. What is the Hubble red shift and what does it imply about the universe?

6. List two possible causes for sudden extinction of a species of life.

7. What are two causes of ocean currents?

8. the planet Venus is often called the "morning star" and the "evening star" because it is often seen (from Earth) just before sunrise and just after sunset. Does this imply that the orbit of Venus (around the Sun) is closer to the Sun or farther from the Sun than the earth's orbit? (A sketch may help you answer this question).

9. Death Valley is just east of the Sierra Nevada Mountains in California and is at a very low elevation (in much of the valley is below sea level). What are two reasons to explain why its weather is usually hot and dry?

10. What are two possible causes of glacial periods or "ice ages" in the Earth's history?

11. Why are earthquakes associated with relatively narrow geographic areas such as along the San Andreas Fault, the west coast of South America, the Aleutian islands in Alaska and along the volcanic island chains of the western Pacific Ocean (Japan, Philippines, Fiji, Indonesia), etc.?