



NAME _____

Directions: Answer the following questions using the information provided. Show your work. If additional space is needed, please attach a separate piece of paper and correctly identify the problem it correlates to. If you are creating a table or graph, be sure to include titles and labels.

1) The pronghorn, an animal native to the American prairie, is the second fastest land animal in the world. These animals have been clocked at speeds of 50-60 mph (even faster in a few cases).

a) You are a zookeeper in charge of the outdoor mammals. A zoo in Canada calls to ask about exhibiting pronghorn. They need to know how fast pronghorn run in km/h (or kph), not mph. Assume the animals' top speed is 61 mph. What will you tell them? Round your answer to the closest whole number.

(1 mile = 1.6 kilometers)

98 KILOMETERS/HOUR (KPH)

b) If a pronghorn travels 7.5 miles in 11 minutes, how fast was it going in miles per hour? Assume the animal is running in a straight line at a uniform speed. Round to the closest whole number.

41 MPH

c) If a pronghorn were escaping from a predator in the wild, such as a wolf or a coyote, it might initially take off at top speed of 60 mph for one minute and then continue at 35 mph for five minutes. How much distance would the animal cover in that time? Use values to one decimal place to reach your answer.

3.9 MILES



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2) Given below are speeds of some animals found at the Minnesota Zoo. Some values are running speeds, some are swimming speeds, and some are flying speeds.

Peregrine Falcon: 200 mph (free-fall dive)

Moose: 35 mph (run)

Beaver: 6 mph (swim)

Pronghorn: 61 mph (run)

Wild Turkey: 15 mph (run)

Canada Goose: 60 mph (flying)

Bison: 32 mph (run)

Green sea turtle: 2 mph (swim)

a) Create a line graph with the animals listed along the x-axis and their respective speeds plotted up the y-axis. All speeds given are upper limit values. Do not include the peregrine falcon for this question.

GRAPHS WILL VARY; TEACHER SHOULD CHECK FOR ACCURACY





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b) What percentage of the animals listed **move** (in any way) faster than the bison?

50% MOVE FASTER THAN A BISON

c) What is the average **running** speed of the animals listed above? Round off to the closest whole number. Plot this value on your graph.

36 MPH IS THE AVERAGE RUNNING SPEED

d) Regardless of the method of locomotion, what is the average speed of all the species listed above? What reason(s) would you give to argue that this average is not an accurate representation for the majority of these animals?

**51 MPH IS THE AVERAGE OF ALL SPECIES LISTED.
THE SPEED OF THE FALCON SKEWS THE AVERAGE TO THE HIGH SIDE, MAKING THE
AVERAGE UNNATURALLY HIGH FOR THE REMAINING ANIMALS.**

e) How could you include the peregrine falcon's free-fall dive speed on your graph without making the y-axis very large? Discuss ideas with your classmates and your teacher.

ANSWERS WILL VARY.



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3) A peregrine falcon is flying at a height of 350 feet above the ground. It spots a pigeon (one of its favorite foods) below, flying at a height of 75 feet above the ground. The shadows of the two birds on the ground are exactly 150 feet apart. The sun is directly overhead.

a) Using this information, draw a right-angled triangle to show the positions of the falcon and the pigeon, relative to the ground.

TEACHERS SHOULD CHECK DIAGRAM

b) If the falcon stays at its altitude of 350 feet, the pigeon at 75 feet, and their shadows stay 150 feet apart while they are both flying, calculate the shortest distance between the falcon and the pigeon. Round your answer to the closest whole number. You will need to use the Pythagorean Theorem for this question.

$$(c^2 = a^2 + b^2).$$

313 FEET

c) How quickly could the falcon reach the pigeon if it is flying at a speed of 75 mph? Assume the pigeon maintains a constant speed and direction. Give your answer in seconds to one decimal place.

$$(1 \text{ mile} = 5280 \text{ feet}, 1 \text{ hour} = 3600 \text{ seconds})$$

2.8 SECONDS



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- 4) Sri Lankan junglefowl (an endangered bird that looks like a fancy chicken) can run at a top speed of 9 mph. A human sprinter can run 2.2 times faster than the jungle fowl. A moose traveling at top speed can run 1.8 times faster than a human.

a) Given this information, how fast can a human run in mph?

19.8 MPH

- b) How fast can a moose run in mph and kph (kilometers per hour)? Round your answer to one decimal place.
(1 kilometer = 0.62 miles)

56.5 KPH

- c) Let “x” represent the speed of the jungle fowl. Create an algebraic expression that represents the speed of the human and the speed of the moose.

HUMAN WOULD BE (2.2)X; MOOSE WOULD BE (2.2)(1.8)X OR (3.96)X

- d) Using these expressions, create another expression to show how you would calculate the average speed of these three species. What is the average speed? Round your answer to one decimal place.

$[X + (2.2)X + (3.96)] \div (3) = 21.5 \text{ MPH}$