LAB 07 QUESTIONS

QUESTION 1

If the angle x measures 15^{o}, how fast is the truck traveling in feet per second? Answer to the nearest foot per second.

1 points

QUESTION 2

Use your answer from question 1. Express the speed in miles per hour. Answer to the nearest mile per hour.

1 points

QUESTION 3

If the angle x measures 20^{o}, how fast is the truck traveling in feet per second? Answer to the nearest foot per second.

0.5 points

QUESTION 4

Express the speed in miles per hour. Answer to the nearest mile per hour.

0.5 points

QUESTION 5

What is true about the value of the answer to 2 divided by the answer to 1, as compared with the value of the answer to 4 divided by the answer to 3? How can you use that to simplify further calculations of conversions between feet per second and miles per hour?

- The ratio is about 0.68 in both cases. In general, you can multiply a given speed expressed in feet per second by 0.68 to convert the speed to miles per hour.
- The ratio is about 1.47 in both cases. In general, you can multiply a given speed expressed in feet per second by 1.47 to convert the speed to miles per hour.
- The speed in feet per second is the same as the speed in miles per hour.
- The ratio varies depending on the specific speed in feet per second.

1 points

QUESTION 6

If the speed limit is 55 miles per hour and a speeding ticket is issued for speeds of 5 miles per hour or more over the speed limit, for what angles should the trooper issue a ticket?

- Any angle bigger than 17.16^o
- Any angle less than 17.16^o
- Any angle bigger than 18.82^o
- Any angle less than 18.82^o

1 points

QUESTION 7

What general rule gives the the speed of the truck *s* in feet per second as a function of the angle *x*?

- s = (cot x) /30
- s = cot (x/30)
- s = 30 cot x
- s = (tan x) /30
- s = tan (x/30)
- s = 30 tan x

1 points

QUESTION 8

Use a graphing utility to examine the function you derived in 7. You can use a graphing calculator, or the Grapher we have used before. You will probably need to adjust the vertical and horizontal scales separately to see interesting features of the graph. What restricted domain should you choose so that the function models the physical constraints of the situation in the picture?

- $0^o < x < 90^o$
- $0^o < x < 180^o$
- $0^o < x < 45^o$
- $45^o < x < 90^o$
- $90^o < x < 180^o$

1 points

QUESTION 9

What happens to the speed of the truck as given by the model when the angle *x* approaches 0^o? (Answer by looking at the function graph, and justify the answer by common sense.)

- The speed grows without bound
- The speed shrinks towards zero
- The speed approaches the legal limit of 55 mph
- The speed approaches the allowed limit of 60 mph
- The speed approaches 30 mph, making an isoceles right triangle

1 points

QUESTION 10

The next day, a different policeman parks 25 feet from the road instead of 30 feet, and uses the same technique of determining speed by measuring the angle x one second after the vehicle passes. What happens to the relationship between the angle and the speed with the patrol car in this new position?

- The same angle corresponds to a speed that is higher
- The same angle corresponds to a speed that is lower
- The position of the police car does not affect the relation between the measured angle and the speed

1 points

QUESTION 11

What is the error in the reported speed (in miles per hour) if the true value of x is 15^o but the measured value of x is 14^o? Assume the police car is in the original position, 30 feet from the road.

- 1
- 5.7
- 8.36
- 112
- 120

0.5 points

QUESTION 12

What is the error in the reported speed (in miles per hour) if the true value of x is 10^o but the measured value of x is 9^o?

- 1
- 5.7
- 8.36
- 13.14
- 19.27
- 170

189

0.5 points