

TEKS 2A.9.D



LESSON

8-8

Problem Solving

Solving Radical Equations and Inequalities

The formula $s = \sqrt{30fd}$ can be used to estimate the speed, s , in miles per hour that a car is traveling when it goes into a skid, where f is the coefficient of friction and d is the length of the skid marks in feet.

1. How does the speed vary as the length of the skid marks? _____
2. Kody skids to a stop on a street with a speed limit of 35 mi/h. His skid marks measure 52 ft, and the coefficient of friction is 0.7. Kody says that he was driving only about 30 mi/h. Kody wants to prove that he was not speeding.
 - a. Solve the equation for d in terms of s . _____
 - b. How long would the skid marks be if he had been driving at a speed of 35 mi/h? _____
 - c. Was Kody speeding or not? Explain how you know.

 - d. Find his actual speed. _____
3. Ashley skids to a stop on a street with a speed limit of 15 mi/h to avoid a dog who runs into the street about 20 ft ahead of her. Ashley claims to have been going less than 15 mi/h. The coefficient of friction is 0.7.
 - a. If Ashley were driving the speed limit, by what distance would she have missed the dog?

 - b. If Ashley were driving less than 10 mi/h, by what distance would she have missed the dog?

Choose the letter for the best answer.

4. Barney was driving at 25 mi/h. A car pulls out 30 ft ahead of him. Which statement is true?
 - A Barney hits the car.
 - B Barney stops less than a foot from the car.
 - C Barney misses the car by 3 ft.
 - D Barney's skid marks measure 23 ft.
5. On a busy highway with a speed limit of 70 mi/h, a truck ahead of Verna jackknifes across the road. Verna skids to a stop 10 ft short of the truck. Her skid marks measure 260 ft. Was Verna speeding?
 - A Yes; her speed was 73.9 mi/h.
 - B Yes; her speed was 75.3 mi/h.
 - C No; her speed was 70 mi/h.
 - D No; her speed was only 63 mi/h.

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Problem Solving

Solving Radical Equations and Inequalities

The formula $s = \sqrt{30fd}$ can be used to estimate the speed, s , in miles per hour that a car is traveling when it goes into a skid, where f is the coefficient of friction and d is the length of the skid marks in feet.

1. How does the speed vary as the length of the skid marks? Directly

2. Kody skids to a stop on a street with a speed limit of 35 mi/h. His skid marks measure 52 ft, and the coefficient of friction is 0.7. Kody says that he was driving only about 30 mi/h. Kody wants to prove that he was not speeding.

$$d = \frac{s^2}{30f}$$

a. Solve the equation for d in terms of s .

b. How long would the skid marks be if he had been driving at a speed of 35 mi/h?

About 58 ft

c. Was Kody speeding or not? Explain how you know.

No; possible answer: his skid marks were only 52 ft, not 58 ft.

d. Find his actual speed.

About 33 mi/h

3. Ashley skids to a stop on a street with a speed limit of 15 mi/h to avoid a dog who runs into the street about 20 ft ahead of her. Ashley claims to have been going less than 15 mi/h. The coefficient of friction is 0.7.

a. If Ashley were driving the speed limit, by what distance would she have missed the dog?

About 9 ft

b. If Ashley were driving less than 10 mi/h, by what distance would she have missed the dog?

By at least 15 ft

Choose the letter for the best answer.

4. Barney was driving at 25 mi/h. A car pulls out 30 ft ahead of him. Which statement is true?

A Barney hits the car.

B Barney stops less than a foot from the car.

C Barney misses the car by 3 ft.

D Barney's skid marks measure 23 ft.

5. On a busy highway with a speed limit of 70 mi/h, a truck ahead of Verna jackknifes across the road. Verna skids to a stop 10 ft short of the truck. Her skid marks measure 260 ft. Was Verna speeding?

A Yes; her speed was 73.9 mi/h.

B Yes; her speed was 75.3 mi/h.

C No; her speed was 70 mi/h.

D No; her speed was only 63 mi/h.