Name _____ Date _____ Class _____

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. Does the speed vary directly or inversely 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 was Kody speeding.

   Solution:

   $s = \sqrt{30fd}$

   $s^2 = (\sqrt{30fd})^2$

   $s^2 = 30fd$

   a. Solve the equation for *d* in terms of *s*.
   $$\frac{s^2}{30f} = d$$
   _____

   b. How long would the skid marks be if he had been driving at a speed of 35 mi/h?
   $$\frac{3s^2}{30{:}7} = d,$$
   _____

   c. Was Kody speeding? Explain how you know.

   _____

   d. Find his actual speed.

   _____

3. Ashley skids to a stop on a street with a speed limit of 15 miles per hour to avoid a dog 20 ft ahead of her. The coefficient of friction is 0.7.

   a. If Ashley were driving at 15 miles per hour, by what distance would she have missed the dog?

   _____

   b. If Ashley were driving less than 10 miles per hour, by what distance would she have missed the dog?

   _____

   c. What is the maximum speed Ashley could be driving and be able to stop before hitting the dog?

   _____

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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. Does the speed vary directly or inversely 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 was Kody speeding.

   Solution:

   $s = \sqrt{30fd}$

   $s^2 = (\sqrt{30fd})^2$

   $s^2 = 30fd$

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

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

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

   $\dfrac{3s^2}{30 \cdot 7} = d,$

   c. Was Kody speeding? 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 miles per hour to avoid a dog 20 ft ahead of her. The coefficient of friction is 0.7.

   a. If Ashley were driving at 15 miles per hour, by what distance would she have missed the dog?

   About 9 ft

   b. If Ashley were driving less than 10 miles per hour, by what distance would she have missed the dog?

   By at least 15 ft

   c. What is the maximum speed Ashley could be driving and be able to stop before hitting the dog?

   $s < 20.4$ miles per hour.