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MENU Grade 8

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Name: _____

Date: _____

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Example The reaction Distance R , has been calculated to be about the number of feet as the speed a vehicle is traveling in miles per hour. The Braking Distance B , is the distance in feet traveled after the brakes are applied:

$$B = 0.05R^2$$

The Stopping Distance, S , is the Reaction Distance plus the Braking Distance:

$$S = R + 0.05R^2$$

Find the stopping distance for a car traveling 39 miles per hour.

Solution → $R = 39$ feet, because the car's speed is 39 miles per hour.

$$S = R + 0.05R^2$$

$$S = 39 + 0.05(39^2) \text{ Replace } R \text{ with } 39.$$

$$= 39 + 0.05(1,521)$$

$$= 39 + 76.05$$

$$= 115 \text{ feet}$$

The car's stopping distance is 115.05 feet.

1. Calculate the stopping distance for a car traveling 66 miles per hour.
2. Calculate the stopping distance for a car traveling 36 miles per hour.
3. Calculate the stopping distance for a car traveling 61 miles per hour.
4. Calculate the stopping distance for a car traveling 60 miles per hour.
5. Calculate the stopping distance for a car traveling 70 miles per hour.
6. Calculate the stopping distance for a car traveling 66 miles per hour.
7. Calculate the stopping distance for a car traveling 46 miles per hour.
8. Calculate the stopping distance for a car traveling 21 miles per hour.
9. Calculate the stopping distance for a car traveling 32 miles per hour.
10. Calculate the stopping distance for a car traveling 79 miles per hour.

1. _____
2. _____
3. _____
4. _____
5. _____

6. _____
7. _____
8. _____
9. _____
10. _____

Teacher Answer Key

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TEKS - 8.1a,b

$$\begin{aligned} 1. \quad S &= 66 + 0.05 (66^2) \\ &= 66 + 0.05 (4,356) \\ &= 66 + 217.8 \\ &= 283.80 \text{ feet} \end{aligned}$$

$$\begin{aligned} 8. \quad S &= 21 + 0.05 (21^2) \\ &= 21 + 0.05 (441) \\ &= 21 + 22.05 \\ &= 43.05 \text{ feet} \end{aligned}$$

$$\begin{aligned} 2. \quad S &= 36 + 0.05 (36^2) \\ &= 36 + 0.05 (1,296) \\ &= 36 + 64.8 \\ &= 100.80 \text{ feet} \end{aligned}$$

$$\begin{aligned} 9. \quad S &= 32 + 0.05 (32^2) \\ &= 32 + 0.05 (1,024) \\ &= 32 + 51.2 \\ &= 83.20 \text{ feet} \end{aligned}$$

$$\begin{aligned} 3. \quad S &= 61 + 0.05 (61^2) \\ &= 61 + 0.05 (3,721) \\ &= 61 + 186.05 \\ &= 247.05 \text{ feet} \end{aligned}$$

$$\begin{aligned} 10. \quad S &= 79 + 0.05 (79^2) \\ &= 79 + 0.05 (6,241) \\ &= 79 + 312.05 \\ &= 391.05 \text{ feet} \end{aligned}$$

$$\begin{aligned} 4. \quad S &= 60 + 0.05 (60^2) \\ &= 60 + 0.05 (3,600) \\ &= 60 + 180 \\ &= 240.00 \text{ feet} \end{aligned}$$

$$\begin{aligned} 5. \quad S &= 70 + 0.05 (70^2) \\ &= 70 + 0.05 (4,900) \\ &= 70 + 245 \\ &= 315.00 \text{ feet} \end{aligned}$$

$$\begin{aligned} 6. \quad S &= 66 + 0.05 (66^2) \\ &= 66 + 0.05 (4,356) \\ &= 66 + 217.8 \\ &= 283.80 \text{ feet} \end{aligned}$$

$$\begin{aligned} 7. \quad S &= 46 + 0.05 (46^2) \\ &= 46 + 0.05 (2,116) \\ &= 46 + 105.8 \\ &= 151.80 \text{ feet} \end{aligned}$$