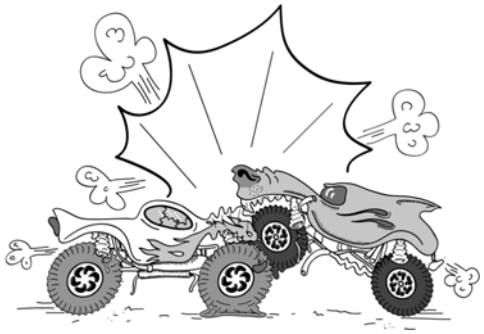
What If?

NAME _____

1. What if your car and the other group's car changed starting locations?

a) Calculate when the cars are predicted to crash, and show your work.



b) Would the crash position change? Why or why not?

2. What if your car was twice as fast and the other group's speed was unchanged?

a) Explain how the graph of your car's movement over time would change.

b) What would be the new system of equations used to represent the car crash?

c) When and where would the cars crash? Show your work.

3. What if both cars were twice as fast?

a) Explain how the graphs of movement over time would change.

b) When and where would the cars crash? Show how you determined this.

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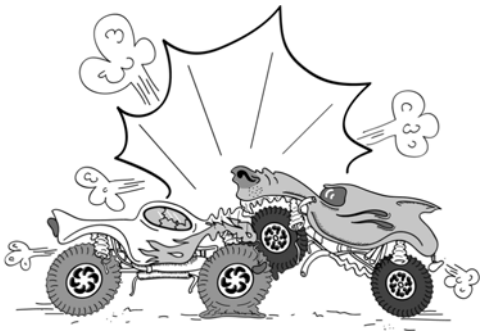
Answer Key – What If?

Note: The values in this answer key are based on the same data as the Road Rage activity sheet. Student answers will vary based on personal data.



1. What if your car and the other group's car changed starting locations?

a) Calculate when the cars are predicted to crash, and show your work.

$$\begin{aligned} y &= 3.61x \\ y &= 100 - 4.32x \\ 100 - 4.32x &= 3.61x \\ 100 &= 7.93x \\ x &\approx 12.6 \text{ seconds} \end{aligned}$$

b) Would the crash position change? Why or why not?

The position would change to approximately $3.61(12.6) \approx 45$.
For the faster car, the distance traveled would still be about 55 units, but since it would start at position 100 instead, the crashing position would change to approximately $100 - 55 = 45$.
A similar explanation could be given for the movement of the slower car.

2. What if your car was twice as fast and the other group's speed was unchanged?

a) Explain how the graph of your car's movement over time would change.

The graph would be steeper because the slope would be greater.

b) What would be the new system of equations used to represent the car crash?

$y = 100 - 7.22x$ (changed because of increased speed)
$y = 4.32x$ (unchanged)

c) When and where would the cars crash? Show your work.

$$\begin{aligned} 100 - 7.22x &= 4.32x \\ 100 &= 1.54x \\ x &\approx 8.7 \text{ seconds} \end{aligned}$$

The position is about $4.32(8.7) \approx 37$ units from the starting line.

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3. What if both cars were twice as fast?

a) Explain how the graphs of movement over time would change.

Both graphs would be steeper because both slopes would be greater.

b) When and where would the cars crash? Show how you determined this.

$$\begin{aligned} y &= 100 - 7.22x \\ y &= 8.64x \\ 100 - 7.22x &= 8.64x \\ 100 &= 15.86x \\ x &\approx 6.3 \text{ seconds} \end{aligned}$$

The position is about $8.64(6.3) \approx 54$ units from the starting position.

This is the same crash position as the original problem.

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