Forces – Lesson 13: Stopping Distances – Higher

Name: …… **Class: ……..**

Q1. How is stopping distance calculated?

[1 mark]

Q2. Define ***thinking distance***.

[1 mark]

Q3. Define ***braking distance***.

[1 mark]

Q4. Complete the table for thinking distance, braking distance and stopping distance for the speeds in the table below:

Speed (mph)	Thinking distance (m)	Braking distance (m)	Stopping distance (m)
20	6	6	
30		14	23
40	12		36
50	15		
60		55	
70			96

[6 marks]

Q5. Describe the forces for each distance and provide a reason for your answer:

a) Thinking distance:
Reason:

b) Braking distance:
Reason:

[4 marks]

Q6. List the TWO factors that can affect ***thinking*** distance.

(i)
(ii)

[2 marks]

Q7. Name ONE factor that affects ***reaction*** time and explain how.

Factor:
Effect:

[2 marks]

Q8. Explain how driving in icy conditions affects the braking distance.

[3 marks]

Total = / 20 marks

Forces – Lesson 13: Stopping Distances – Higher ANSWERS

Name: …… **Class: ……..**

Q1. How is stopping distance calculated?

Stopping distance = thinking distance + braking distance

[1 mark]

Q2. Define ***thinking distance***.

The distance the vehicle travels during the driver's reaction time

[1 mark]

Q3. Define ***braking distance***.

The distance the vehicle travels under the braking force

[1 mark]

Q4. Complete the table for thinking distance, braking distance and stopping distance for the speeds in the table below:

Speed (mph)	Thinking distance (m)	Braking distance (m)	Stopping distance (m)
20	6	6	**12**
30	**9**	14	23
40	12	**24**	36
50	15	**38**	**53**
60	18	55	**73**
70	**21**	**75**	96

[6 marks]

Q5. Describe the forces for each distance and provide a reason for your answer:

a) Thinking distance: **BALANCED**
Reason: **the car is moving at constant speed**

b) Braking distance: **UNBALANCED**
Reason: **the car is DECELERTING (frictional force from the brakes is greater than the forward force of the vehicle.**

[4 marks]

Q6. List TWO factors that can affect ***thinking*** distance.

(i) **Speed of vehicle**
(ii) **Reaction time**

[2 marks]

Q7. Name ONE factor that affects ***reaction*** time and explain how.

Factor: **Drugs**
Effect: They affect your sense of judgement of distance/timing/coordination, so your Reaction time increases.

[2 marks]

Q8. Explain how driving in icy conditions affects the braking distance.

On ice there is less friction between the road and the car's tyres. This means the braking force will decrease, so on ice the braking distance will be greater

[3 marks]

Total = / 15 marks

Forces – Lesson 13: Stopping Distances – Foundation

Name: …… **Class: ……..**

Q1. Stopping distance = thinking distance + braking distance

Define:
a) ***Thinking distance***:

[1 mark]

Q3. ***Braking distance:***

[1 mark]

Q2. Complete the table for thinking distance, braking distance and stopping distance for the speeds in the table below:

Speed (mph)	Thinking distance (m)	Braking distance (m)	Stopping distance (m)
20	6	6	
30		14	23
40	12		36
	15	38	53
	18	55	
		75	96

[6 marks]

Q3. Choose the correct answer to complete the statements:

(i) The longer the stopping distance…..
   a) the shorter the time to stop means a lower risk of crashing into the vehicle ahead
   b) the longer time to stop means a higher risk of crashing into the vehicle ahead
   Answer: __

[1 mark]

Q4. Which of the following factors affects ***thinking*** distance?

(i) Speed of vehicle, Mass of vehicle, reaction time, road surface

[2 marks]

Q5. Explain how tiredness can be dangerous when driving a vehicle.

[2 marks]

Q8. Explain how driving in icy conditions affects the braking distance.

[2 marks]

Total = / 15 marks

Forces – Lesson 13: Stopping Distances – Foundation ANSWERS

Name: …… **Class: ……..**

Q1. Stopping distance = thinking distance + braking distance

Define:

a) ***Thinking distance***: **the distance the vehicle travels during the driver's reaction time**

[1 mark]

Q3. ***Braking distance:*** **the distance the vehicle travels under the braking force**

[1 mark]

Q2. Complete the table for thinking distance, braking distance and stopping distance for the speeds in the table below:

Speed (mph)	Thinking distance (m)	Braking distance (m)	Stopping distance (m)
20	6	6	**12**
30	**9**	14	23
40	12	**24**	36
50	15	38	53
60	18	55	**73**
70	**21**	75	96

[6 marks]

Q3. Choose the correct answer to complete the statements:

(i) The longer the stopping distance…..

c) the shorter the time to stop means a lower risk of crashing into the vehicle ahead

d) the longer time to stop means a higher risk of crashing into the vehicle ahead

Answer: ***b***

[1 mark]

Q4. Which of the following factors affects ***thinking*** distance?

(i) **Speed of vehicle**, Mass of vehicle, **reaction time**, road surface

[2 marks]

Q5. Explain how tiredness can be dangerous when driving a vehicle.

A person will have slower reactions/ longer reaction time and this will increase your thinking distance

[2 marks]

Q8. Explain how driving in icy conditions affects the braking distance.

On ice there is less friction between the road and the car's tyres/ the braking force will decrease, so on ice the braking distance will be greater

[2 marks]

Total = / 15 marks