

Student's Guide

First day on the job

mematics

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Context

You have recently been hired as an investigator for the Wontcofup insurance company. On your first day, you are sent to the scene of an accident between a small car and a delivery truck. You arrive to find the driver of the car on a stretcher in an ambulance. She is conscious, but bruised and shaken up. When you open your work file, you find the following letter:

Dear New Inspector,

At 7:30 this morning, a driver insured by our company (Policy No.: 241-575-374B) collided with a delivery truck in a small alley linking Peel Street to Metcalfe Street in downtown Montreal. Although the speed limit in the alley is 20 km/h, the collision seems rather severe. Please determine whether Clause 315-6 of the policy can be applied. Note that a solid body of evidence is required to apply this clause. Although I don't remember your given name, I do recall being told good things about the quality and thoroughness of your work.

Sincerely,

Hugo "The Boss"

P.S.: Since this is your first day, I have attached Clause 315-6 to this letter.

<u>Clause 315-6:</u> In the event that the policyholder is found criminally responsible¹ or negligent² in his or her driving, the insurance company will assume only 50% of the repair costs and reserves the right to increase the premium for a subsequent period of five years. For the company to defray the repair costs, the holder must agree to provide access to any medical files related to the accident claim.

1. The term *criminally responsible* refers to impaired driving or driving under the influence of illicit substances, such as alcohol, cannabis or cocaine.

2. The term negligent refers to driving in flagrant contravention of the Highway Safety Code, such as crossing more than two lanes in less than 100 m or driving more than 30 km/h above the speed limit.



Three-Step Cycle

List all the *revelant* information you have gathered from the problem. Based on this information, state what you need to know to solve the problem. As new information comes in, you will want to summarize and update the relevant information you have gathered and ask new questions.

List the following:

What we know	What we need to know	Summary

Questions



1) What relevant information does the fine print in Clause 315-6 give you?

2) State a physics question and a non-physics question that must be asked at this stage of the problem.

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You go through a number of stages to pursue your enquiry, such as analyzing the policyholder's file, interviewing eyewitnesses, analyzing the accident scene, reviewing the driver's medical file and interviewing the attending physician.

Name:	Maria Andretti		
Address:	500 Shumaker Drive		
	Montreal, Quebec, Canada		
	F1A B4U		
Age:	52 years		
Driving experience:	24 years		
Previous claims:	1993/\$3,576; 1981/\$1,200		
Policy type:	All-risk insurance		
	INCLUDING: Fire		
	Theft		
	Vandalism (Max. \$35,000)		
Legal liability:	\$1,000,000		
Deductible:	\$500		
Insured car:			



Eyewitness Account:

"I saw the car come into the alley. I don't know how fast it was going. The truck backed up from that loading dock and was sideways across the alley. I heard a big BANG! It all happened so fast. It looked like the driver didn't see the truck. I don't even think the car had time to brake."

Accident Scene:

- Right-angled collision (90°) between the car and the truck.
- Front end of car crushed: 43 cm remaining between front bumper and centre of front wheel
- Right side of truck dented on impact: 5 cm in depth
- No apparent skid marks

Driver's Medical File Following the Accident:

- BP (blood pressure): 105/65
- HR (heart rate): 103
- Ecchymosis (bruising) on forehead and forearm
- Seat belt lacerations on neck and chest
- Drug toxicology screen: Opiates: negative
 - Cocaine: negative Alcohol: negative

Interview with Attending Physician:

- Doctor: The seat belt saved her life! There was considerable impact.
- You: How could you tell?
- Doctor: Well, from experience, I can tell you that a seat belt laceration of this size corresponds to an impact of between 20 g and 25 g.
- You: Wow! 20 to 25 times the gravitational acceleration that's enormous! How confident are you in this value?
- Doctor: Well, it's certainly more than 20 g, but not deep enough for 25 g (pager rings). Sorry, I have to run now; I'm receiving an emergency call.
- You: OK. Thank you for your time.



Questions (continued)

3) What new information did you obtain?

4) Do you need more information or do you have enough to report back to the boss? If you have all the information you need, what will you be reporting back to the boss? If you need more information, how do you propose to obtain it?