



Exam VSBO PBL

2026

period 1

Monday, May 18

7.30 – 9.30 a.m.

Physics and Chemistry 1

Candidate name _____ Candidate number _____

Write all answers in this assignment booklet.

This exam consists of 33 questions.

You can score a maximum of 61 points for this exam.

Before each question number, it is stated how many points can be scored with a correct answer.

Multiple-choice questions

- Circle the correct answer (example 1).
- Indicate corrections according to example 2 or 3.

- (1) A
 ⓑ
 C
 D
- (2) A
 ⓧ
 ⓐ
 D
- (3) B A
 ⓧ
 ⓧ
 D

Marvin goes to school

- 1p 1 Every day Marvin walks to the bus stop to go to school.
The walk takes about 15 minutes. The distance he walks is
about 502..... .

→ Which unit must replace the dots?

- A meters
B kilometers
C centimeters
D hectometers



- 3p 2 On a given day, Marvin's bag weighs 753 grams.
Given is the formula:

force = mass × gravitational acceleration ($F = m \times g$)

→ Calculate the force of gravity on Marvin's bag. Include the unit.

.....
.....

Force of gravity is:

.....
unit

- 1p 3 At home, Marvin has an instrument that he uses to measure the weight of his school bag.
Four measuring instruments are shown below.



Marvin uses one of these instruments to measure the weight of his school bag.

→ Which measuring instrument is that?

- A instrument 1
- B instrument 2
- C instrument 3
- D instrument 4

The road surface

- 2p 4 After Marvin gets on the bus, the bus travels further. After 150 meters the chauffeur sees a large hole in the road surface.
- 0.8 seconds later, the chauffeur reacts and he hits the brakes.
 - Meanwhile, the bus drives 11 meters.
 - While braking the bus drives 35 meters.



Given is the formula:

stopping distance = reaction distance + braking distance

→ Calculate in meters the stopping distance of the bus.

.....

.....

- 1p 5 Given are the following four types of materials:
Synthetic material, metal, concrete and **wood**.
One of these four is sometimes used to fill holes in the road surface.
- Which is that?
- A synthetic material
 - B metal
 - C concrete
 - D wood
- 1p 6 → Which material property can easily lead to holes in the road surface?
- A low material density
 - B poor conduction of sound
 - C poor conduction of heat
 - D poor conduction of electricity

Safety and Binas

- 1p 7 The picture next to this text shows a cleaning agent. Najira uses this cleaning agent.
- The safety sign printed on the face of the bottle is shown below the picture.
- This safety sign is a message to Najira about what precaution she must take while using this agent.
- What is the message about the precaution to be taken? Use your Binas-information booklet.
- The message is:**
- Najira must
-

cleaning agent



safety sign



1p 8 In Ms. Menshe's Physics & Chemistry 1 class, a lot of practical work is done. Today, her students must do the following.

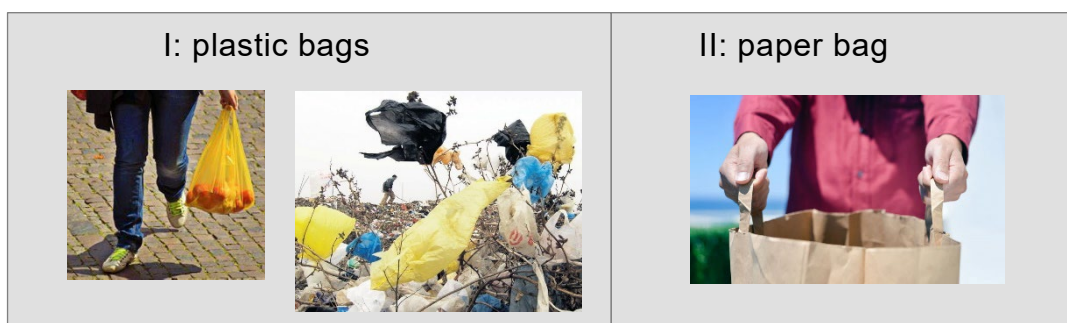
1. Heat a solid substance.
2. While heating, keep track of the temperature of the substance.
3. During heating, observe that at 52 °C, the substance begins to change from a solid to a liquid.

→ What is the name of this substance? Use your Binas-information booklet.

.....

Environment

1p 9 In picture I below, plastic bags are shown.
Picture II shows a paper bag.



Some shops and mini-markets are replacing plastic bags with paper bags. Below are two statements comparing paper and plastic.

- 1). Using paper instead of plastic provides a cleaner environment.
- 2). Using paper instead of plastic means less use of petroleum.

→ What applies to these two statements?

- A only statement 1 is true
- B only statement 2 is true
- C both statements are true
- D both statements are false

- 2p 10 If a sewer is not cleaned regularly, it can become clogged. This causes stagnant rainwater to form in a sewer during the rainy season. See the picture below.



This situation does not look neat. In addition, there are negative effects that this situation causes for the surroundings and the environment.

→ Write down two negative effects that this situation causes for the surroundings and the environment.

Negative effect 1:

.....

Negative effect 2:

.....

3p 11 The picture below shows a lot of waste.



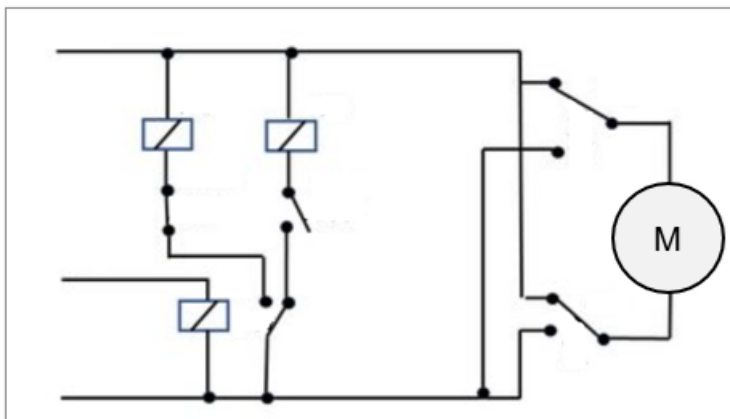
In waste processing, waste is separated into different types. There are letters shown on twelve parts of the photo. These letters are A, B, C, D, E, F, G, H, I, J, K, and L. The letters are colored white or red so that they are clearly visible. In the table below, the letters A and C have already been filled in.

→ Complete the table by filling in the correct names of the types of waste and the letters of the parts that correspond to them.

	letters	name or type of waste
type 1	A,	Vfg-waste / food(scrap)
type 2	C,	
type 3		
type 4		

Components in an electrical circuit

3p 12 The image below shows only **a part** of an electrical circuit.



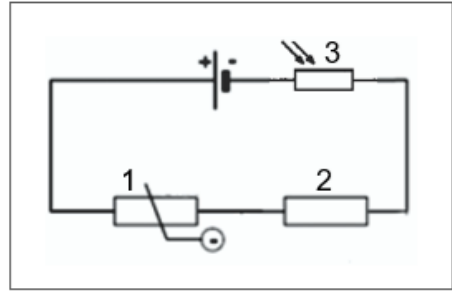
The circuit consists of various types of components.

→ In the table below, indicate which components are **present** and which are **not present** in the table. Use your Binas-information booklet.

component	<i>present</i>	<i>not present</i>
voltage source		
resistor		
changeover switch		
motor (electric motor)		

- 2p **13** The electrical circuit drawn alongside has three types of resistors, namely: resistors 1, 2 and 3.

The following applies to one of the three:
As the temperature rises, the value of this resistor decreases.

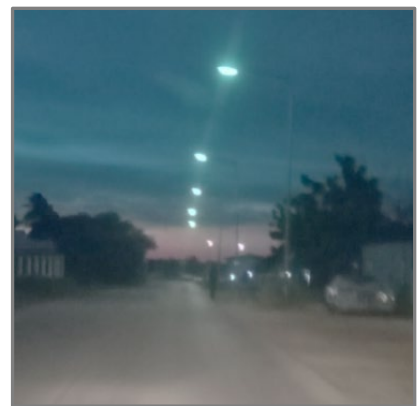


→ Which of the three resistors is that?

Write down the number and the name of this resistor.

The number is the name is

- 2p **14** The streetlights in the image alongside turn on automatically in the evening and off automatically in the morning.
One of the resistors in the electrical circuit in question 13 can ensure that these streetlights switch on and off automatically.



→ Write the number and the name of that resistor.

The number is and the name is

- 2p **15** In Curaçao the mains voltage is **117 volts**.
Charging a phone requires only **5 volts**.

The charger contains a component **P** that automatically changes the voltage.



→ Complete the sentence below correctly and draw the corresponding symbol.

Component P is a(n)	drawing
----------------------------------	---------

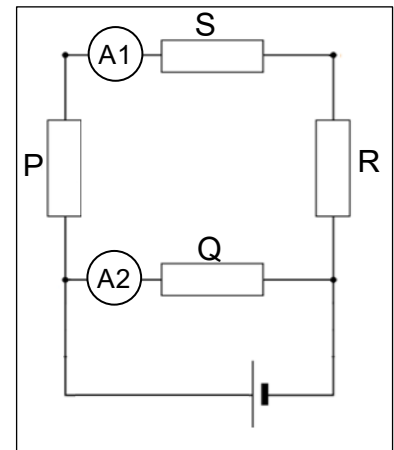
Electrical circuits

- 1p **16** The image next to this text shows an electrical circuit. The circuit has:
four resistors P, Q, R and S and two
ammeters A1 and A2.

→ Which amperage does ammeter A1 measure?

Ammeter A1 measures the amperage ...

- A** only through S.
- B** only through P and S.
- C** only through P, S and R.
- D** through P, Q, R and S.



- 1p **17** Take another look at the circuit in question 16.

→ Which amperage does ammeter A2 measure?

Ammeter A2 measures the amperage ...

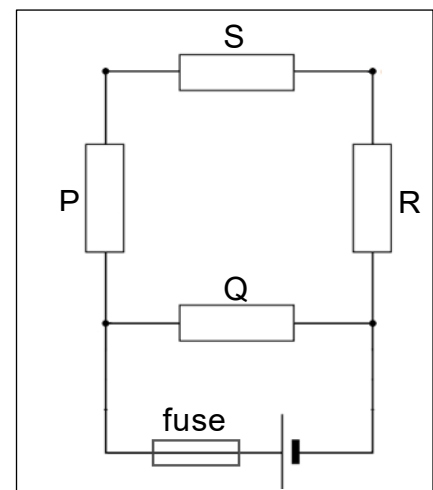
- A** only through P.
- B** only through Q.
- C** only through P, S and R.
- D** through P, Q, R and S.

- 1p **18** The image alongside shows an electrical circuit.
The circuit has one fuse and four resistors,
namely: P, Q, R and S.

→ What applies to this fuse?

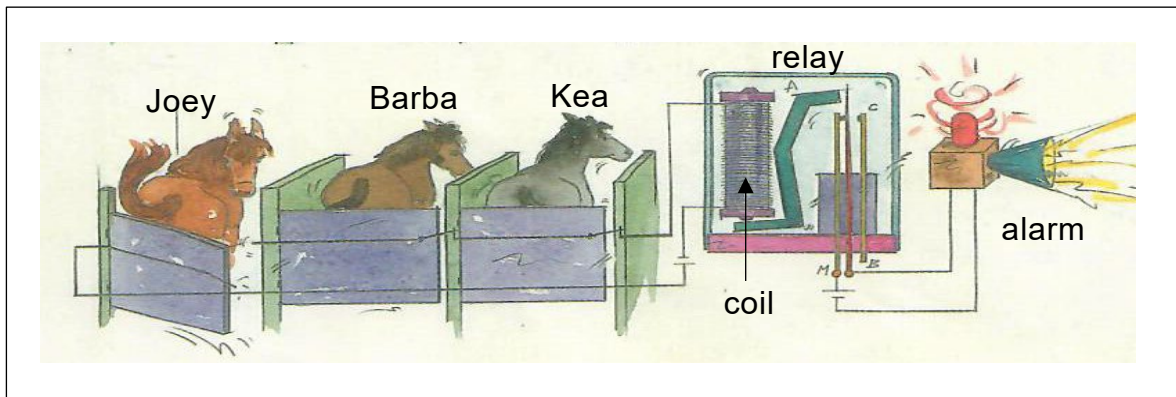
The fuse protects ...

- A** only resistor Q.
- B** only resistors P, S and R.
- C** all four resistors P, Q, R and S.
- D** none of the four resistors: P, Q, R nor S.



Horse stable

- 1p 19 The gates of the horse stable in the picture below are secured with an alarm system.



The alarm system consists of two circuits, a left side circuit and a right side circuit. The relay coil is part of the left side circuit. The alarm is part of right side circuit.

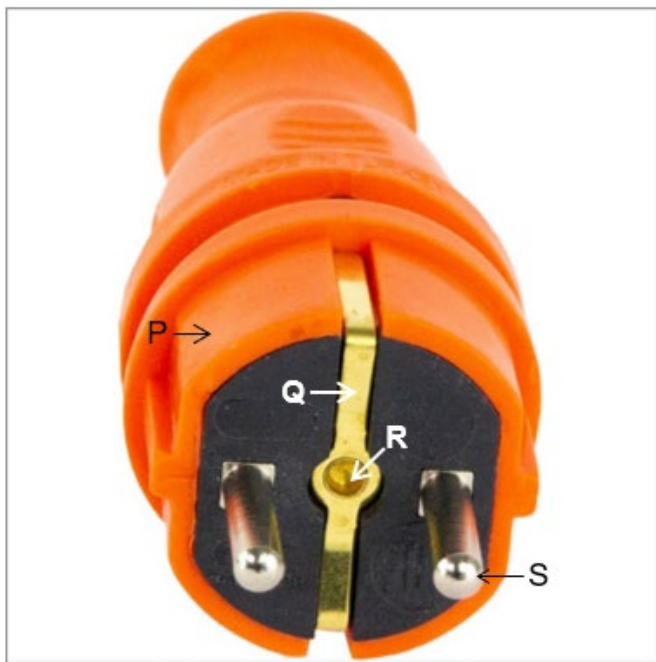
Joey kicks the gate. The gate opens and the alarm immediately goes off. The alarm wails.

→ What applies to left and right circuits when the alarm sounds?

	left side circuit is ..	right side circuit is ...
A	open	open
B	closed	closed
C	open	closed
D	closed	open

Conductors and insulators

2p 20 The picture below shows a plug.

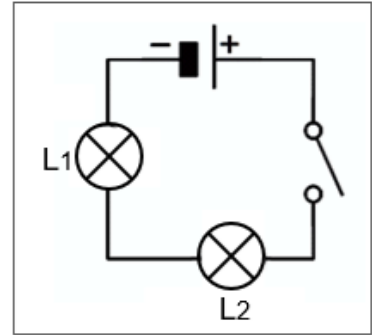


The letters P, Q, R and S indicate four different components of the plug.

→ In the table below, indicate for each component whether it is a **conductor** or an **insulator**. Do this with X-marks.

component	conductor	insulator
1. orange casing (P)		
2. gold colored metal clamp (Q)		
3. copper colored screw (R)		
4. silver colored connection rod (S)		

- 3p 21 The image alongside shows an electrical circuit.
The circuit consists of:
- a battery that supplies a voltage of 4.5 volts.
 - a switch that is open.
 - a lightbulb L1 with a resistance of 200 ohms.
 - a lightbulb L2 with a resistance of 300 ohms.



The circuit is closed with the switch.

Given is the formula: $U = I \times R$

→ Calculate the amperage through lightbulb L1 in mA.
Do this following steps 1 and 2 here below.

Step 1). First calculate the total resistance.

.....

.....

Step 2). Calculate the amperage through lightbulb L1.

.....

.....

.....

Calculating energy

- 2p **22** The total power of two lights, L1 and L2, combined is 0.000162 kW. The two lights shine for 60 minutes and together they consume an amount of electrical energy during those 60 minutes.

Given is the formula: $\text{energy} = \text{power} \times \text{time} \quad (E = P \times t).$

→ How many kilowatts-hour (kWh) of energy did these two lights use in 60 minutes?

.....

.....

.....

- 3p **23** The picture next to this text shows a secondary fire indicator. The device has two lights that have been on day and night for 1 year now.

- The total power of these two lights combined is 2.5 watts.
- 1 kWh costs 35 cents.



Given is the formula: $\text{energy} = \text{power} \times \text{time} \quad (E = P \times t).$

→ Calculate the amount to be paid for 1 year's energy costs for these two lights. Do this as follows:

step 1:	Calculate the time in hours.	time =
step 2:	Calculate the energy consumption.	energy consumed =
step 3:	Calculate and write the correct amount.	amount =

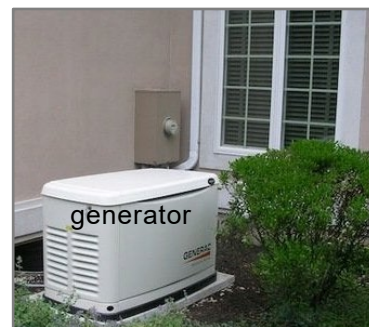
Sound

- 1p 24 Mrs. Job is lying in bed. Lying in bed, she hears the sound of her generator outside.

Hearing is the way sound is perceived.

→ What does Mrs. Job actually hear?

- A only a vibration period.
- B only a frequency.
- C only a volume.
- D a frequency and a volume.



- 3p 25 The table below lists ten words related to sound and to the situation in question number 24.

receiver	speed of sound	sound source	frequency	transmitter
transmission medium	volume	decibel	amplitude	pitch

There are five incomplete sentences below.

→ Complete each sentence correctly. For each sentence, choose one word from the table.
A word may only be used once.

- 1). The generator is a(n)
- 2). The generator is also a(n)
- 3). Mrs. Job is a(n)
- 4). Mrs. Job hears a(n)
- 5). The air is a(n)

- 2p 26 Marsia strikes the same guitar string three times in a row.
Every time before she strikes the string she changes the situation.

1st time: She does **not** press the string with her finger.

2nd time: She **does** press the string with her finger.

3rd time: The string is tighter, and she **does** press the string with her finger.

Below there are two sentences with choice words.

→ Underline the correct choice word in each sentence.

Sentence 1).

On the second (2nd) strike the pitch is

lower than

equal to

the first time.

higher than

Sentence 2).

On the third (3rd) strike the pitch is

lower than

equal to

the first time.

higher than

- 2p 27 Tasha is a trampoline jumper.
In the picture alongside, arrows 1 and 2 indicate her up and down movements.

There are forces that cause and make possible these two movements 1 and 2.

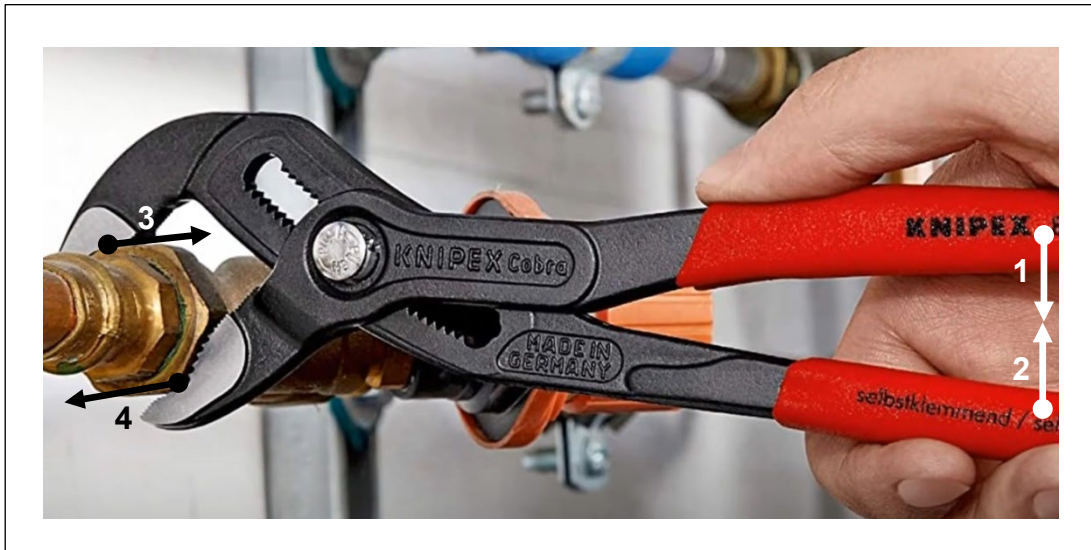
→ Name these forces.



1.
2.
3.

Lever

1p 28 The picture below shows a pipe wrench.



Robert applies forces 1 and 2 to the wrench handles.
This causes the wrench to exert forces 3 and 4 on the nut.
Forces 1 and 2 combined have the effect a force of 200 newtons.

→ What then applies to 3 and 4?

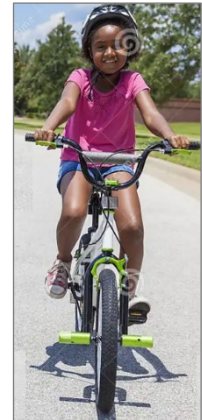
3 and 4 combined have the effect of a force ...

- A** less than 200 newtons
- B** equal to 200 newtons.
- C** greater than 200 newtons.

Queenrella and her bicycle

- 4p 29 Queenrella can now ride a bike on her own and she takes a ride on her brand new bike. The table below shows information about Queenrella's bike ride.

duration	distance
from 0 to 4 seconds	15 meters
from 4 to 9 seconds	20 meters
from 9 to 12 seconds	10 meters
another 10 seconds	50 meters



→ Calculate the average speed of the entire journey in m/s.
Write down your calculation and round off to one decimal.

.....

.....

.....

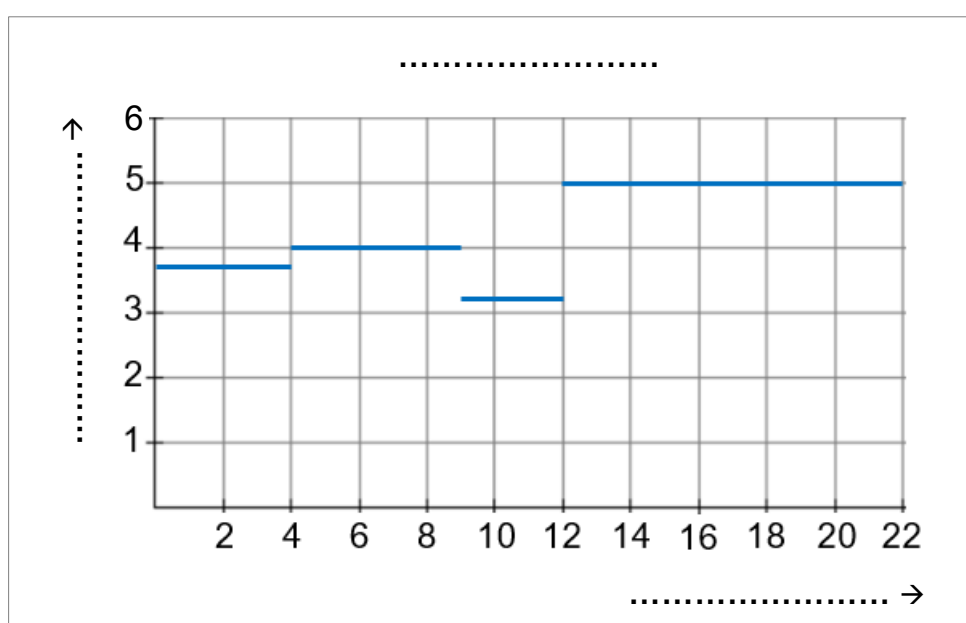
.....

Average speed is m/s.

- 1p 30 The table below three types of data are given.
- Queenrella's riding **velocity**,
 - **Duration** of her ride with that velocity,
 - The **distance** she covers during that specific time.

velocity	duration	distance
3.75 m/s	4 seconds	15 meters
4 m/s	5 seconds	20 meters
3.33 m/s	3 seconds	10 meters
5 m/s	10 seconds	50 meters

Together, the blue line segments in the coordinate system below form the graph of Queenrella's bike ride.



In the graph **the title**, **the name** of the horizontal axis and **the name** of the vertical axis are missing.

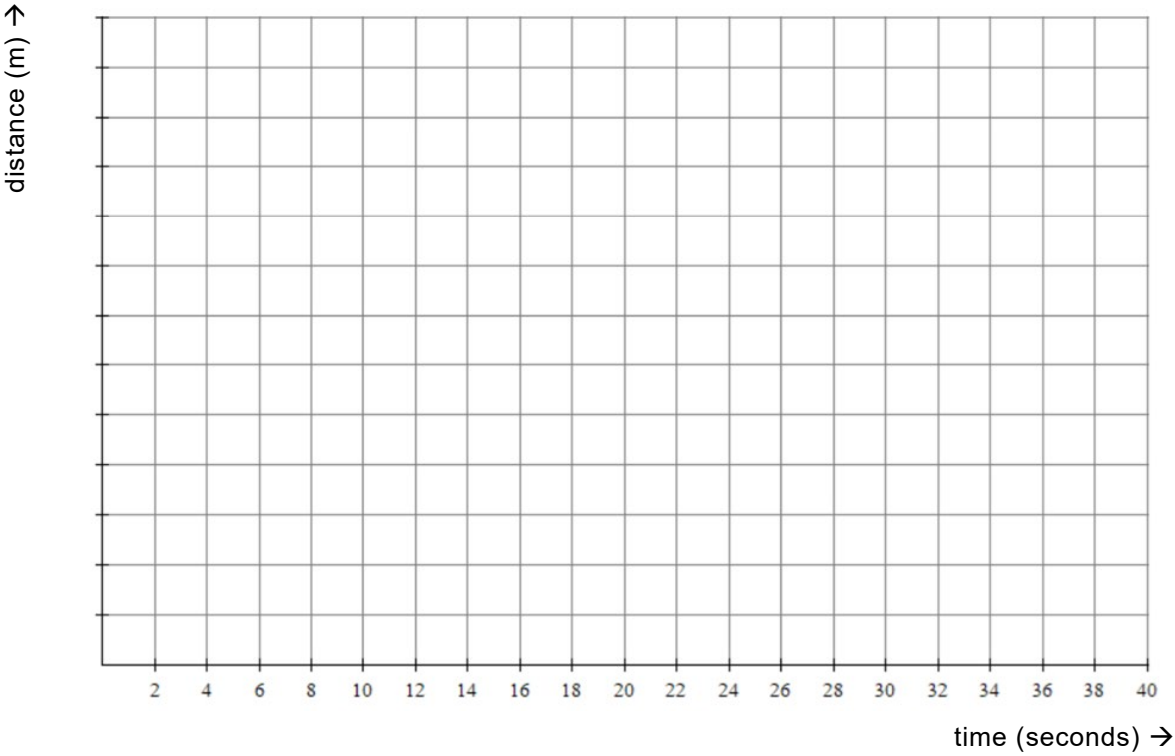
→ Which three options in the choices below belong to this graph?

	title	name horizontal axis	name vertical axis
A	v-t graph	distance in meters	time in seconds
B	v-t graph	speed in m/s	time in seconds
C	s-t graph	time in seconds	distance in meters
D	s-t graph	time in seconds	speed in m/s

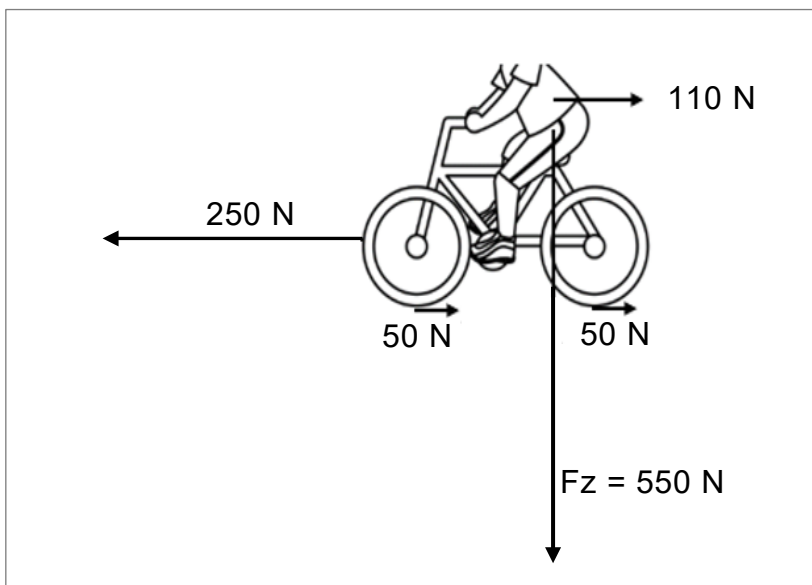
4p 31 Queenrella takes another ride on her bike. This time, Pa keeps track of the elapsed time and the total distance ridden. Pa’s table is shown below.

total time elapsed	total distance
4 seconds	15 meters
9 seconds	35 meters
12 seconds	45 meters
22 seconds	95 meters

→ In the coordinate system below, place the numbers on the vertical axis and draw the s-t diagram of this new ride.



- 2p 32 The image below shows five forces acting on the bike during Queenrella's ride.



→ Calculate the net force. Write down your calculation.

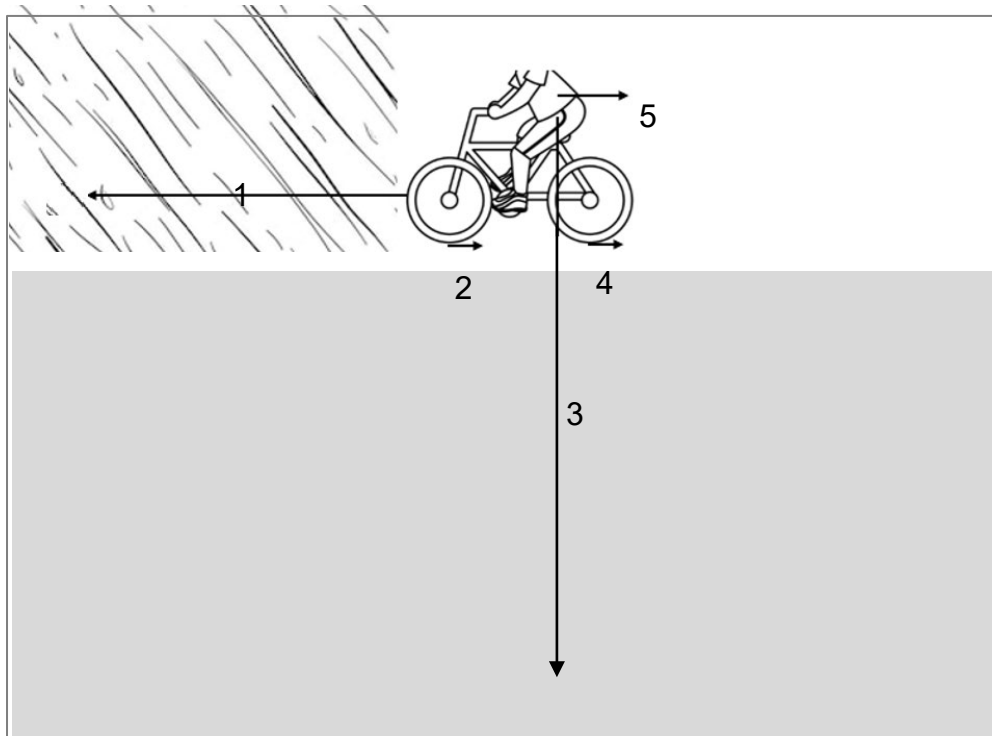
.....

.....

.....

Take note: Question 33 is on the following page.

1p 33 On the way home a heavy shower of rain suddenly pours down.



Queenrella must still cycle 120 meters to get home.
She cycles the last 120 meters at a constant speed through the rain.

In the rain, some of the forces drawn above becomes less.

→ Which forces becomes less?

- A forces 1 and 3.
- B forces 1 and 5.
- C forces 2 and 4.
- D all the forces.