

**KWAZULU-NATAL DEPARTMENT OF
EDUCATION**



**UGU DISTRICT
PHYSICAL SCIENCES
GRADE 10
TERM 2
PROJECT
ACCELERATION
50 MARKS**

Stanmorephysics

2022

| | | |
|---------------------|-------------|---------------|
| NAME OF THE LEARNER | | |
| NAME OF THE SCHOOL | | |
| DATE | | |
| | TOTAL MARKS | LEARNER MARKS |
| PART 1 | 05 | |
| PART 2 | 25 | |
| PART 3 | 20 | |
| TOTAL | 50 | |

PART 1

LEARNERS' CONDUCTING THE EXPERIMENT

Aim: To determine the average velocity of the ball rolling down an inclined plane

Apparatus:

3m long ramp,

Ball,

Tape measure,

Marking pen,

Stopwatch

Method:


1. Place 3m long ramp horizontally.
2. Use marking pen and tape measure to calibrate your ramp at 10cm intervals.
3. Your 3m long ramp must be raised such that it takes at least 10 seconds for the ball to accelerate constantly from the top to the bottom.
4. Roll a ball down an inclined plane and take the readings after two second.
 - Measure the distance travelled after 2 seconds.
 - Measure the distance travelled after 4 seconds.
 - Measure the distance travelled after 6 seconds.
 - Measure the distance travelled after 8 seconds.

RESULTS

Fill in the table.

| TRIAL 1 | | TRIAL 2 | | TRIAL 3 | | AVERAGE | |
|------------------|----------|------------------|----------|------------------|----------|------------------|----------|
| Displacement (m) | Time (s) | Displacement (m) | Time (s) | Displacement (m) | Time (s) | Displacement (m) | Time (s) |
| | 0 | | 0 | | 0 | | 0 |
| | 2 | | 2 | | 2 | | 2 |
| | 4 | | 4 | | 4 | | 4 |
| | 6 | | 6 | | 6 | | 6 |
| | 8 | | 8 | | 8 | | 8 |

MARKING TOOL

| Skills | No Mark | 1 Mark | 2 Marks |
|---|---|---|---|
| Apparatus setup | The apparatus is set up incorrectly.  | The setup of apparatus has been attempted, and is mostly correct-but there are mistakes which may cause errors in the readings taken. | The apparatus is set up correctly in all respects and reliable readings can be taken. |
| Data collection, recording and presentation | Data collected is inaccurate and there is no attempt to record data in appropriate format. Presentation is untidy. | Data is recorded in appropriate format but is insufficient / incorrect /inaccurate in some instances. Fairly neat presentation. | Data recorded logical, sufficient and recorded in an appropriate format (In table with correct headings, units). Well presented. |
| Observation of precautions | The learner works carelessly without any consideration of precautions/instructions. | The learner works with care and records readings carefully and as accurately as possible. | |
| Total | | | <hr/> [05] |

GROUP NO: _____

GROUP MEMBERS:

| NAMES | MARKS |
|-------|-------|
| 1. | |
| 2. | |
| 3. | |
| 4. | |
| 5. | |



**KWAZULU-NATAL DEPARTMENT OF
EDUCATION**



**UGU DISTRICT
PHYSICAL SCIENCES
GRADE 10
EXPERIMENTAL WRITE UP
TERM 2
PROJECT
ACCELERATION**

2022

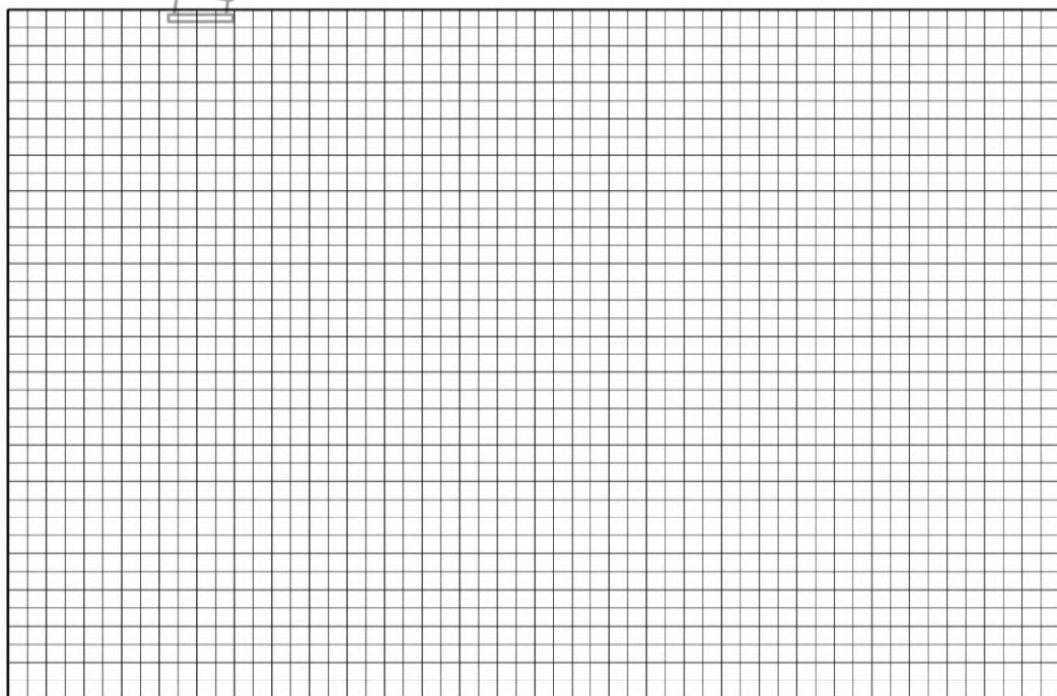
| | | |
|----------------------------|--------------------|----------------------|
| NAME OF THE LEARNER | | |
| DATE | | |
| | TOTAL MARKS | LEARNER MARKS |
| PART 2 | 25 | |



PART 2: EXPERIMENTAL WRITE UP

TO BE ANSWERED INDIVIDUALLY BY LEARNERS

1. Use the results obtained to plot position-time graph (5)



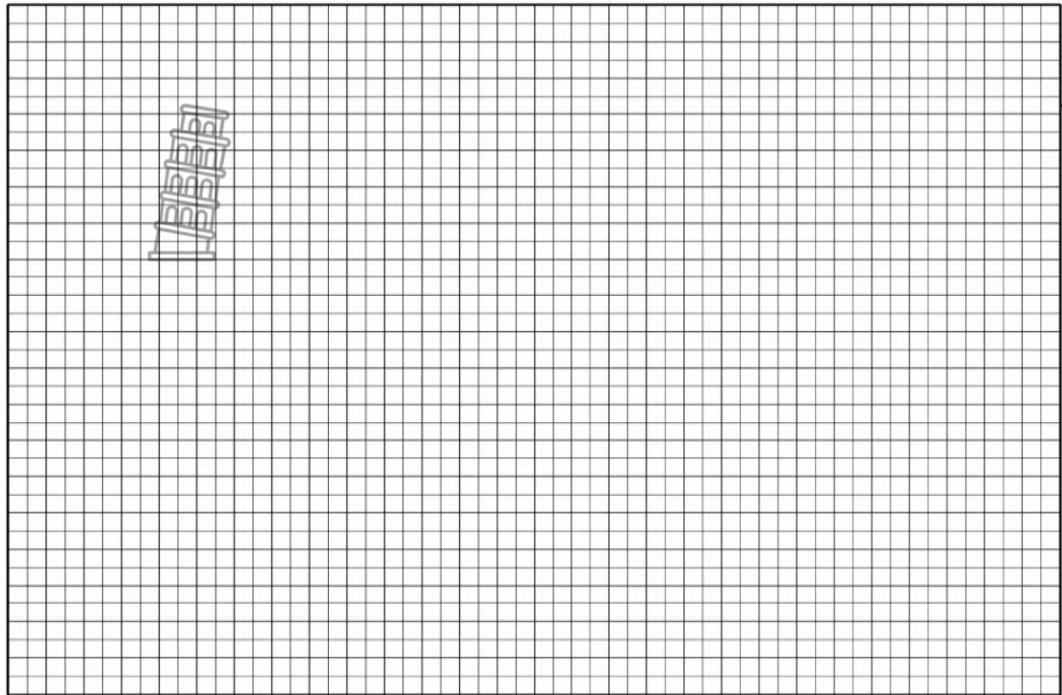
2. What is the shape of the graph? (2)

3. Calculate the average velocity of ball. (3)

| Time (s) | Velocity ($\text{m}\cdot\text{s}^{-1}$) |
|----------|---|
| 0 | |
| 2 | |
| 4 | |
| 6 | |
| 8 | |



4. Plot the velocity-time graph (4)



5. What does the gradient of the velocity-time graph represent? (2)

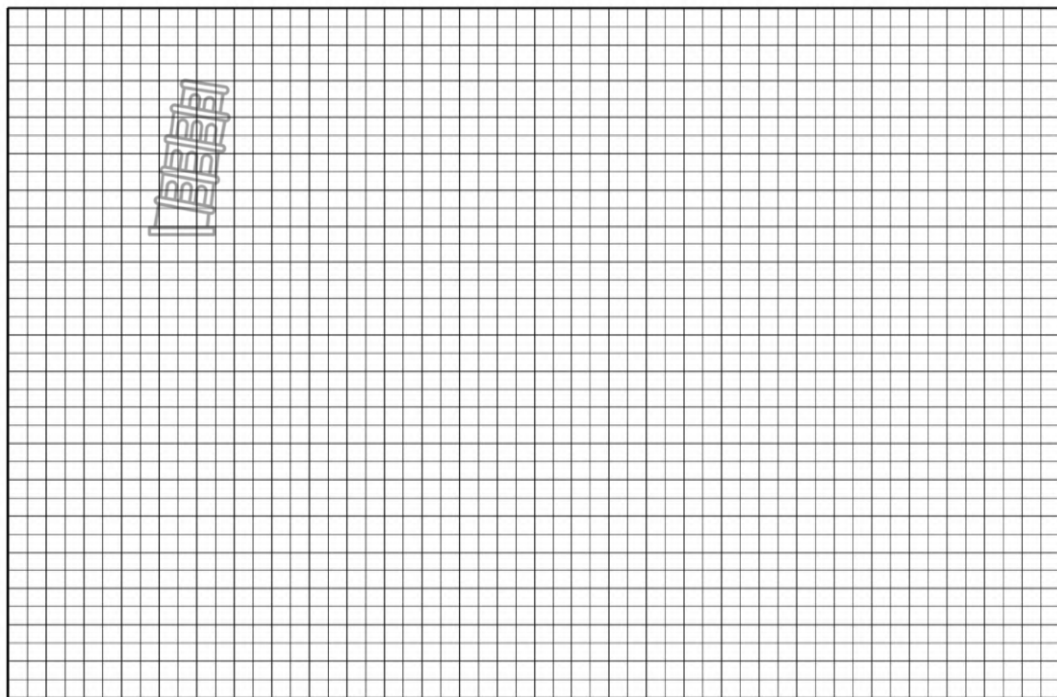
- 6 Calculate the gradient of the velocity-time graph for each time interval indicated on the graph drawn in question 4 (4)

7. Draw conclusion based on the observation (**refer to calculations done in question 6**) (2)



8. Plot the acceleration-time graph

(3)



[20 MARKS]



**KWAZULU-NATAL DEPARTMENT OF
EDUCATION**



**UGU DISTRICT
PHYSICAL SCIENCES
GRADE 10
TEST
TERM 2
PROJECT
ACCELERATION**

2022

| | | |
|----------------------------|--------------------|----------------------|
| NAME OF THE LEARNER | | |
| DATE | | |
| | TOTAL MARKS | LEARNER MARKS |
| PART 3 | 20 | |



PART 3


TEST

TO BE ANSWERED INDIVIDUALLY BY LEARNERS

1. Define the following terms:

1.1. Displacement

(2)



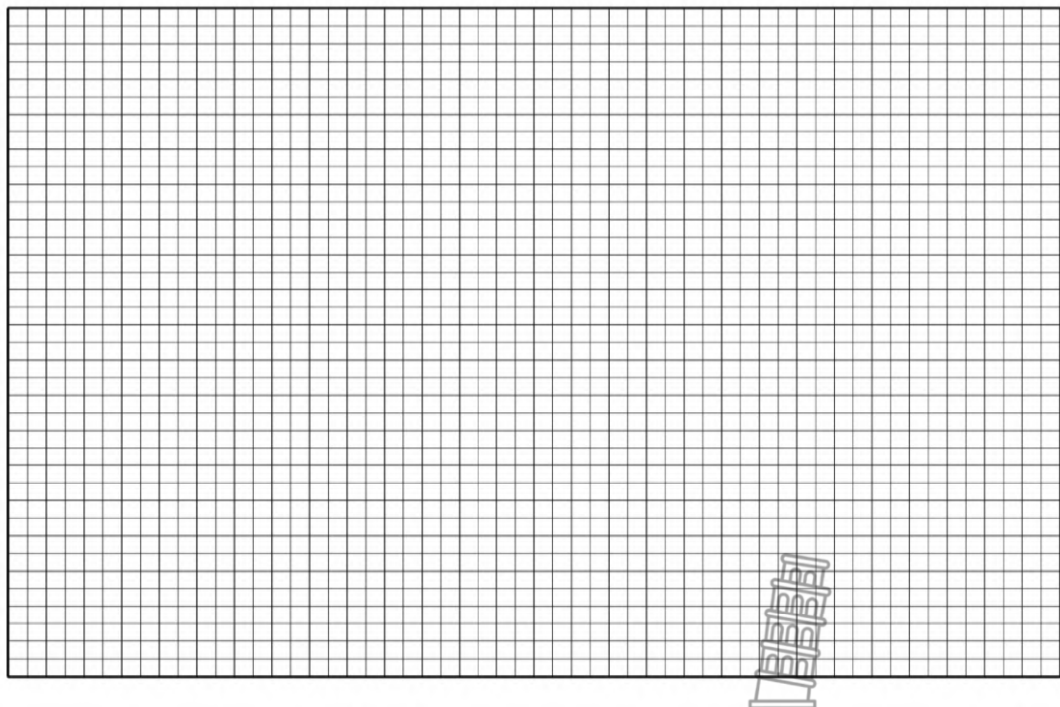
1.2. Acceleration

(2)

2.1. Use the information in the following table to draw the graph.

(3)

| | | | | | | | |
|------------|---|---|---|---|---|---|---|
| Δt | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| v | 2 | 2 | 2 | 2 | 2 | 1 | 0 |

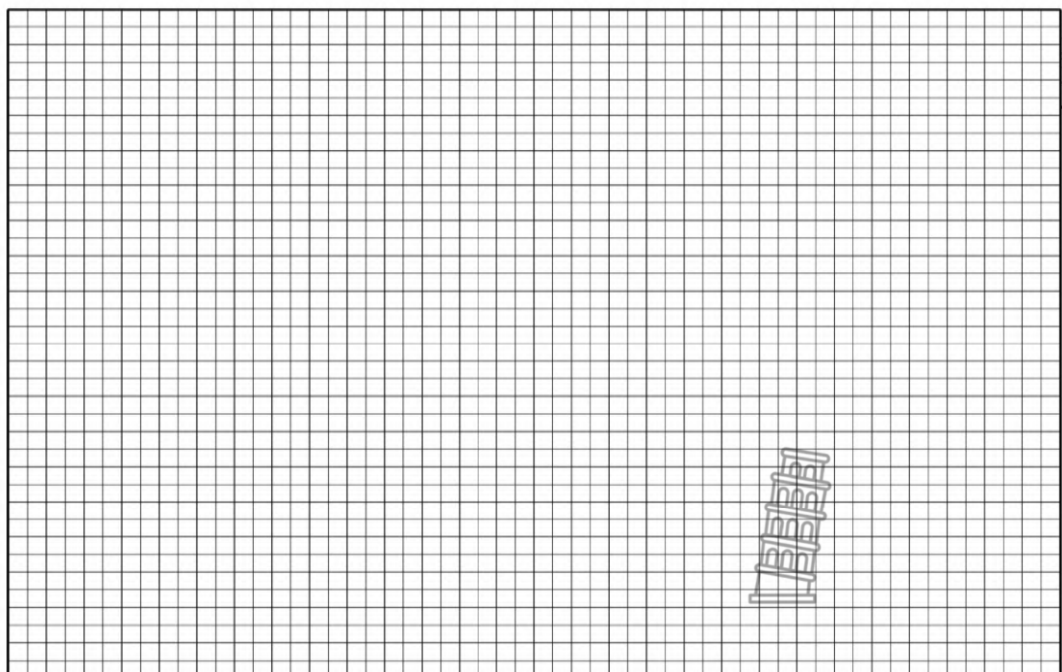


- 2.2. Use the drawn graph in 2.1. to calculate the displacement of the object (3)
WITHOUT USING EQUATIONS OF MOTION.



- 2.3. Use the drawn graph in 2.1. to calculate the acceleration of the object from 4s to 6s, (3)
WITHOUT USING EQUATIONS OF MOTION.

- 2.4. Use the drawn graph in 2.1. to draw acceleration versus time graph. .(3)



3. A taxi is travelling at a constant speed of 54 km.h^{-1} in a 40 km.h^{-1} zone. A policeman starts his car from rest just as the taxi passes him. The police car accelerates at 2 m.s^{-2} until it reaches a maximum velocity of 20 m.s^{-1} . The policeman then continues driving at this constant velocity.

- 3.1. Calculate the time it takes the police car to reach its maximum velocity. (3)



- 3.2. Calculate, which vehicle is ahead at the time calculated in 3.1. (4)

[20 MARKS]

