

Física

Practice development

Ball

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Introduction

Firstly, a ball is a spherical object used in games and sports, which is made of a material that allows it to bounce.

In this practice we will let balls of different sizes and weights roll on an inclined table, with the help of some large and tall support, to have a sufficient angle of inclination so that the balls can roll from a point on it until they fall to the ground. without the help of any initial velocity or exerted force.

Materials

Used in practice:

- A table, mostly smooth
- Balls of different sizes and weights
- Some cans of paint and some thick books to put under the legs of the table and tilt it
- a stopwatch
- A measuring tape or ruler
- Calculator
- A sheet of paper and a pen

Practice development

1. First we will tilt the table with the object we choose, in this case we choose two objects to make two cases, one with paint cans and the other with books, to have different inclinations.
2. Measure the height from the floor to the legs and write them down on a sheet of paper
3. Measure the width of the table, to calculate the distance the balls will travel and also write it down on the sheet

Practice development

4. Let the balls roll one by one, from the edge of the table.

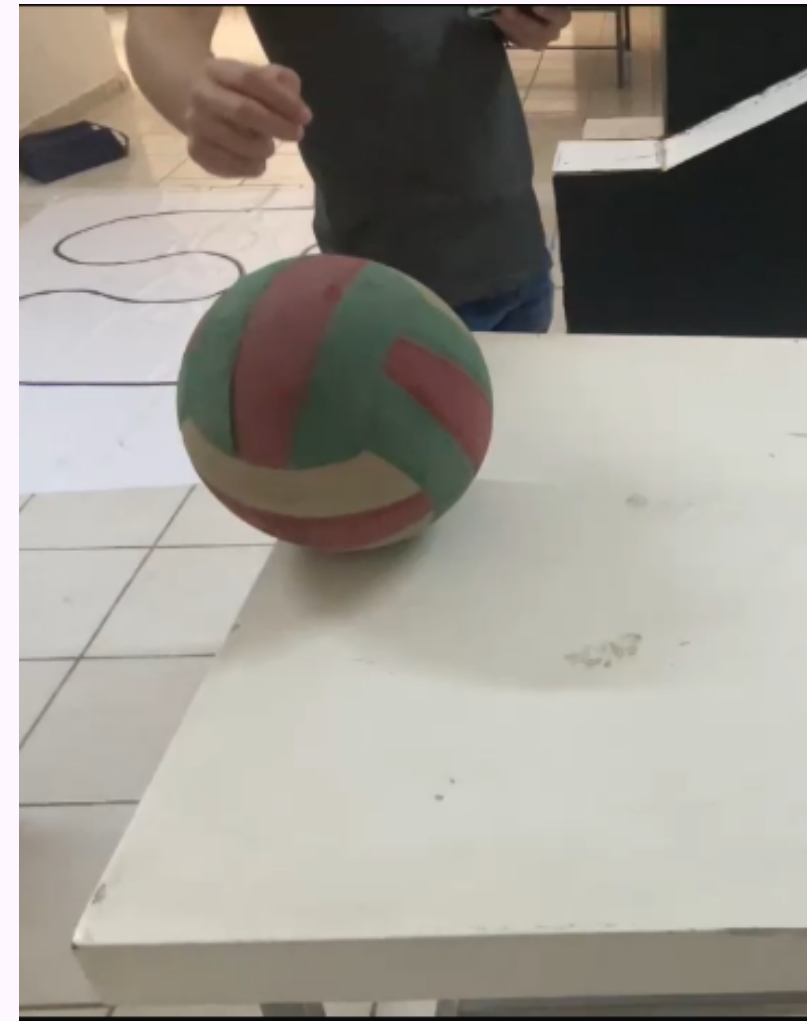
5. At the same time, count the time with a timer, from when we let the balls roll until they fell to the ground.

6. Write down on the sheet all the times given to us by each and every one of the balls separately.

7. Calculate

Caso 1

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Caso 2

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Caso 2

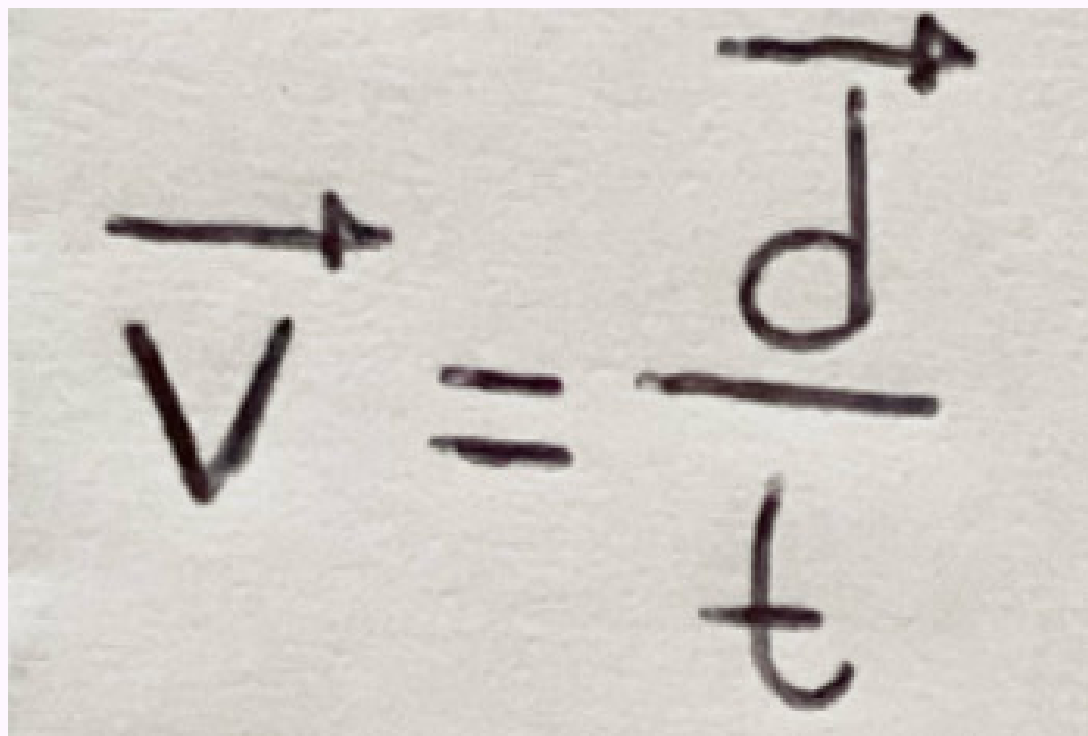
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Calculations to be made

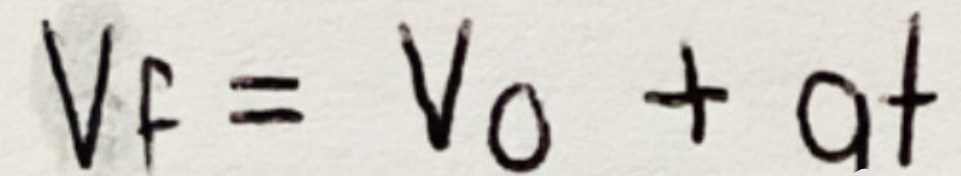
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Velocidad total



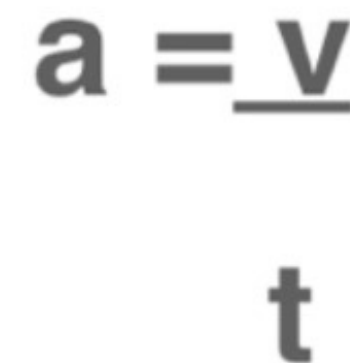
A photograph of a piece of paper with the handwritten formula $v = \frac{d}{t}$. The letter 'v' has a small arrow pointing to the right above it. The letter 'd' also has a small arrow pointing to the right above it. The letter 't' is written below the fraction line.

Velocidad final



A photograph of a piece of paper with the handwritten formula $V_f = V_0 + at$. The letters 'V' and 'a' are in a larger, bolder font than the subscripts and the time variable 't'.

To calculate it we will need



A photograph of a piece of paper with the handwritten formula $a = \frac{v}{t}$. The letter 'v' is underlined.

Calculations to be made

Aceleración

$$a = \frac{v}{t}$$

Desplazamiento

$$d = \frac{v_i t}{2}$$

Calculations to be made

Distancia horizontal

$$d_H = v_H t_{\text{(aire)}}$$

To calculate it we will need

$$t_{\text{(aire)}} = \frac{-2V_{\text{ov}}}{g}$$

$$V_H = v_o \cos \Theta$$

Results

Velocidad total

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Case 1

- Tennis: 30.05 cm/s
- Futbol (Falsa): 42.73 cm/s
- Voley: 27.76 cm/s
- Unisel: 37.59 cm/s

Case 2

- Tennis: .5041 cm/s
- Futbol (Falsa): .54035 cm/s
- Voley: .51827 cm/s
- Unisel: .58353 cm/s

Results

Velocidad final

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Case 1

- Tennis: 30.04 cm/s
- Futbol (Falsa): 42.70 cm/s
- Voley: 27.75 cm/s
- Unisel: 37.58 cm/s

Case 2

- Tennis: .5041 cm/s
- Futbol (Falsa): .5403 cm/s
- Voley: .51827 cm/s
- Unisel: .5835 cm/s

Results

Aceleración

Case 1

- Tennis: 5.90 cm/s²
- Futbol (Falsa): 11.93 cm/s²
- Voley: 5.03 cm/s²
- Unisel: 9.23 cm/s²

Case 2

- Tennis: .10546 cm/s²
- Futbol (Falsa): .12115 cm/s²
- Voley: .11145 cm/s²
- Unisel: 14129 cm/s²

Results

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Desplazamiento

Case 1

- Tenis: 76.47 cm
- Futbol (Falsa): 76.48 cm
- Voley: 76.47 cm
- Unisel: 76.49 cm

Case 2

- Tenis: 1.204 cm
- Futbol (Falsa): 1.204 cm
- Voley: 1.204 cm
- Unisel: 1.204 cm

Results

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Distancia horizontal

Case 1

- Tennis: 1.53 cm
- Futbol (Falsa): 3.10 cm
- Voley: 1.68 cm
- Unisel: 4.80 cm

Case 2

- Tennis: .2954 cm
- Futbol (Falsa): .3392 cm
- Voley: .4567 cm
- Unisel: .3959 cm

Results and Procedures

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Aceleración

Case 1

- Tennis: 5.90 cm/s²
- Futbol (Falsa): 11.93 cm/s²
- Voley: 5.03 cm/s²
- Unisel: 9.23 cm/s²

Case 2

- Tennis: .10546 cm/s²
- Futbol (Falsa): .12115 cm/s²
- Voley: .11145 cm/s²
- Unisel: 14129 cm/s²

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*Thank
You*