Lab – momentum & impulse - stations

BEFORE

AFTER

Station 1 – explosion carts

L

L

R

R

BEFORE

AFTER

Station 2 – bumper cart

Station 3 – collisions on airtrack

AFTER

BEFORE

(a)

C

C

A

A

BEFORE

AFTER

(b)

C

A

A

C

BEFORE

AFTER

(c)

C

C

A

A

Data & Calculations

**Station 1: explosion carts Assign right as positive direction.**

mass cart L \_\_\_\_\_\_\_ g 🡪 \_\_\_\_\_\_ kg mass cart R \_\_\_\_\_\_ g 🡪 \_\_\_\_\_\_ kg

measured velocity of cart L after “explosion” \_\_\_\_\_\_\_\_ m/s

measured velocity of cart R after “explosion” \_\_\_\_\_\_\_\_ m/s (***Do NOT use this number in your calculations***!)

***Calculate the velocity of cart R after the “explosion”.***

|  |  |  |  |
| --- | --- | --- | --- |
|  | before “explosion” |  | after “explosion”  Calculations: |
| cart L: | m = |  | m = |
|  | v = |  | v = |
|  | p = |  | p = |
| cart R: | m = |  | m = |
|  | v = |  | v = |
|  | p = |  | p = |
| total system: | p = |  | p = |

**Station 2: bumper cart Assign toward the bottle as positive direction.**

mass of cart \_\_\_\_\_\_ g 🡪 \_\_\_\_\_\_ kg

measured velocity of cart before hitting the bottle \_\_\_\_\_\_\_\_ m/s

measured velocity of cart after hitting the bottle \_\_\_\_\_\_\_\_ m/s

Calculations:

***Calculate the CHANGE IN MOMENTUM of the cart in hitting the bottle***

***by two different methods.***

|  |  |  |  |
| --- | --- | --- | --- |
|  | before hitting bottle |  | after bouncing off bottle |
| cart | m = |  | m = |
|  | v = |  | v = |
|  | p = |  | p = |

force during collision: \_\_\_\_\_\_\_\_ N time of collision \_\_\_\_\_\_ s

**Station 3: collisions on the airtrack Assign right as positive direction.**

(a)

mass of glider A \_\_\_\_\_\_\_\_ g mass of glider C \_\_\_\_\_\_\_\_ g

measured velocity of glider C before collision \_\_\_\_\_\_\_\_ m/s

measured velocity of glider C after collision \_\_\_\_\_\_\_\_ m/s

measured velocity of glider A after collision \_\_\_\_\_\_\_\_\_ m/s (***Do NOT use this number in your calculations***!)

***Calculate the velocity of glider A after the collision.***

|  |  |  |  |
| --- | --- | --- | --- |
|  | before collision |  | after collision  Calculations: |
| glider C: | m = |  | m = |
|  | v = |  | v = |
|  | p = |  | p = |
| glider A : | m = |  | m = |
|  | v = |  | v = |
|  | p = |  | p = |
| total system: | p = |  | p = |

(b)

mass of glider A \_\_\_\_\_\_\_\_ g mass of glider C \_\_\_\_\_\_\_\_ g

measured velocity of glider C before collision \_\_\_\_\_\_\_\_ m/s

measured velocity of glider A before collision \_\_\_\_\_\_\_\_ m/s

measured velocity of glider C after collision \_\_\_\_\_\_\_\_ m/s

measured velocity of glider A after collision \_\_\_\_\_\_\_\_\_ m/s (***Do NOT use this number in your calculations***!)

***Calculate the velocity of glider A after the collision.***

|  |  |  |  |
| --- | --- | --- | --- |
|  | before collision |  | after collision  Calculations: |
| glider C: | m = |  | m = |
|  | v = |  | v = |
|  | p = |  | p = |
| glider A : | m = |  | m = |
|  | v = |  | v = |
|  | p = |  | p = |
| total system: | p = |  | p = |

(c)

mass of glider A \_\_\_\_\_\_\_\_ g mass of glider C \_\_\_\_\_\_\_\_ g

measured velocity of glider C before collision \_\_\_\_\_\_\_\_ m/s

measured velocity of glider A before collision \_\_\_\_\_\_\_\_ m/s

measured velocity of connected gliders A & C after collision \_\_\_\_\_\_\_\_ m/s\*

Calculations:

\* (***Do NOT use this number in your calculations***!)

***Calculate the velocity of connected gliders A & C after the collision.***

|  |  |  |  |
| --- | --- | --- | --- |
|  | before collision |  | after collision |
| glider C: | m = | connected A & C: | m = |
|  | v = |  | v = |
|  | p = |  | p = |
| glider A : | m = |  |  |
|  | v = |  |  |
|  | p = |  |  |
| total system: | p = | total system: | p = |