

On table, Normal path

$$dx = .218m$$

$$dy = .245m$$

$$V_f^2 = V_{fx}^2 + 2ad_f \text{ (direction)}$$

$$V_f = \sqrt{2(9.8m/s^2)(.245m)}$$

$$V_f = 2.19m/s$$

$$V_f = V_{fx} + at$$

$$\frac{V_f}{a} = t = \frac{2.19m/s}{9.8m/s^2} = .223$$

$$V = \frac{dx}{dt} \text{ (x direction)}$$

$$dx = \frac{.218m}{.223} = .97m/s$$

Objective

Theory

Apparatus

Procedure

Results

↳ Data table

↳ graphs

↳ sample

Conclusion

On floor, Normal Path

$$dy = 1.178m$$

$$dx = V_{ix}t + \frac{1}{2}at^2$$

$$dx = (.97m/s)(.475s) = .4756m$$

$$dy = V_{iy}t + \frac{1}{2}at^2 \text{ (y direction)}$$

$$t = \sqrt{\frac{2dy}{a}} = .475s$$

$$V_f^2 = V_{fx}^2 + 2ad$$

$$V_f = \sqrt{2ad} = \sqrt{2(9.8m/s^2)(1.178m)} = 4.805m/s$$

$$\% \text{ error } (dx) = .1263\%$$

$$\frac{1.475 - .47561}{.475} \times 100 = 0.1263$$

$$.475$$

$$dx \text{ accepted} = .475m$$

On floor, dinged path

$$\Theta = 45^\circ$$

$$dy = 1.178m$$

$$V_{ix} = .97m/s$$

$$V_{ix} = V_{iy} = .69m/s$$

y direction

$$d = V_{iy}t + \frac{1}{2}at^2$$

$$1.178m = (.69m/s)t + (4.9m/s^2)t^2$$

$$0 = 4.9m/s^2t^2 + .69m/s t - 1.178m$$

$$a = 4.9 \quad b = .69 \quad c = -1.178$$

$$t = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$t = .4243563s$$

$$dx = V_{ix}t + \frac{1}{2}at^2$$

$$dx = (.69m/s)(.425) = .289m$$

$$dx = .289m$$

$$\% \text{ error } (dx) = 9.358\%$$

$$100 \times \frac{1.265 - .28981}{.265} = 9.358$$

$$dx \text{ accepted} = .265m$$