



Calculation Error

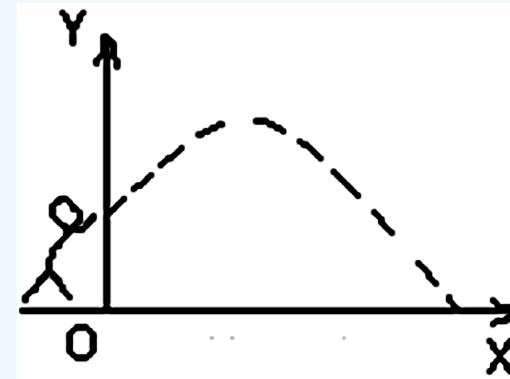
Question

As shown in the figure, if Xiao Li throws a shot put, and the height y (meters) of the shot put from the ground is expressed as $y = -\frac{1}{8}x^2 + \frac{1}{2}x - \frac{3}{2}$,

then the maximum height of the shot put from the ground during its motion is ____ meters.

Ground Truth

2



Model's answer

To solve this problem, we need to find the maximum value of the function $(y = -\frac{1}{8}x^2 + \frac{1}{2}x - \frac{3}{2})$ during the shot put's trajectory. This is a quadratic function with a downward-facing parabola, so we need to find its maximum value.

Solution Steps:

1. Determine the vertex form of the quadratic function:

For a quadratic function of the form $(ax^2 + bx + c)$, where $(a = -\frac{1}{8}, b = \frac{1}{2}, c = -\frac{3}{2})$.

The x-coordinate of the vertex is: $x = -\frac{b}{2a} = -\frac{\frac{1}{2}}{2 \times -\frac{1}{8}} = 4$

2. Calculate the function value at the vertex: Substitute $(x = 4)$ into the original function to find the y-value: $y = -\frac{1}{8}(4)^2 + \frac{1}{2}(4) - \frac{3}{2}$

$$y = -\frac{16}{8} + 2 - \frac{3}{2}$$

$$y = -2 + 2 - \frac{3}{2} = -\frac{3}{2}$$

Therefore, when the shot put reaches its highest point, the height from the ground is $(-\frac{3}{2})$ meters.

Summary:

The answer to this problem is $(-\frac{3}{2})$ meters.

ORM's Feedback

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{
  "status": "WRONG",
  "error_step": "Step 1: Finding the vertex x-coordinate",
  "error_analysis": "The error occurs in finding the vertex x-coordinate. Using the formula  $x = -b/(2a)$  with  $a = -1/8$  and  $b = 1/2$ , we get  $x = -0.5/(2 \times (-1/8)) = -0.5/(-1/4) = 0.5/(1/4) = 2$ . The solution incorrectly calculated this as  $x = 4$ ."
}
```