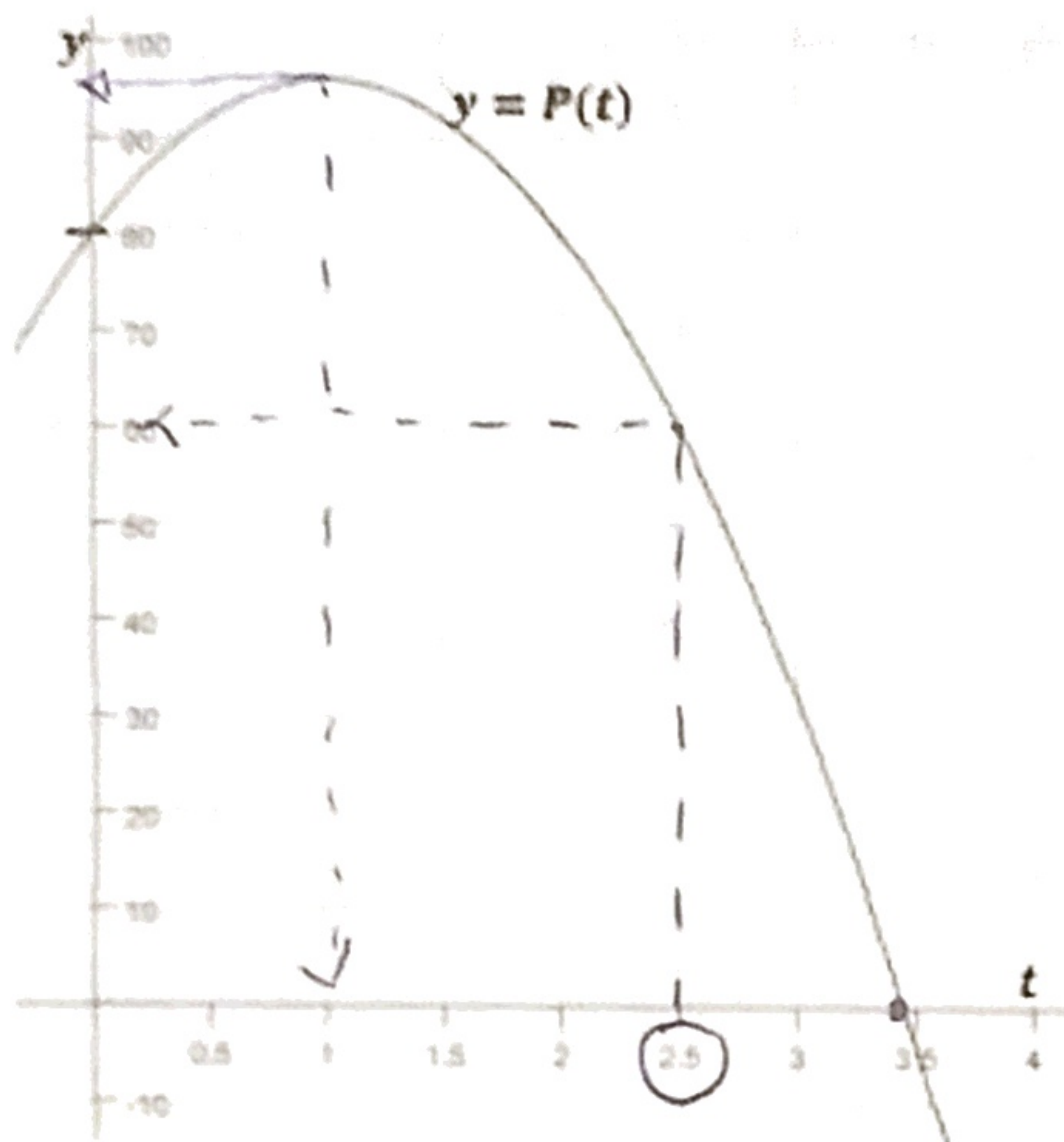


For each problem:

- A. Answer the question
- B. Explain your answer by including whether you used the vertex, x - intercepts, y intercept, or some other point to answer. (This is the more important part of the question!)

Paul and Ryan each threw a paper airplane into the air. The vertical height in inches off the ground is represented by $P(t)$ on the graph for Paul and by $R(t)$ on the table for Ryan. t is the time of the flight.



t	$R(t)$
0	86
0.5	98
1	102
1.5	98
2	86
2.5	66
3	38
3.52	0

y int → (at t=0)
 } incr. (from t=0 to t=1)
 vertex (at t=1, R=102)
 (exact b/c table is symm.)
 } decr. (from t=1 to t=3.52)
 ← hit ground (at t=3.52)

1. Whose airplane went higher? By how much?

Need the y part of the vertex

Paul's went approx 95 in.
 Ryan's went 102 in.

So Ryan's went higher by about 7 in.

2. Whose airplane was in the air longer?

before height is zero so x int.

Paul's in air a little less than 3.5 sec.
 Ryan's in air a little more than 3.5 sec.

So Ryan's was in the air longer.

3. Who was holding their plane higher when they let it go?

time is zero so y int.

Paul's 80 in high.
 Ryan's 86 in high.

So Ryan was holding his higher.

4. Whose airplane reached their maximum height first?

vertex

Paul's reached it at 1 sec.
 Ryan's reached it at 1 sec.

So it was a tie.

5. How high off the ground was Paul's airplane after 2.5 seconds?

a point with 2.5 as the x value $P(2.5) = 60$
 60 inches

A pirate ship was firing cannon balls at smaller ships trying to escape. The x-axis represents the horizontal distance traveled and the y-axis represents the height of the cannonball.

6. Which cannon ball went higher?

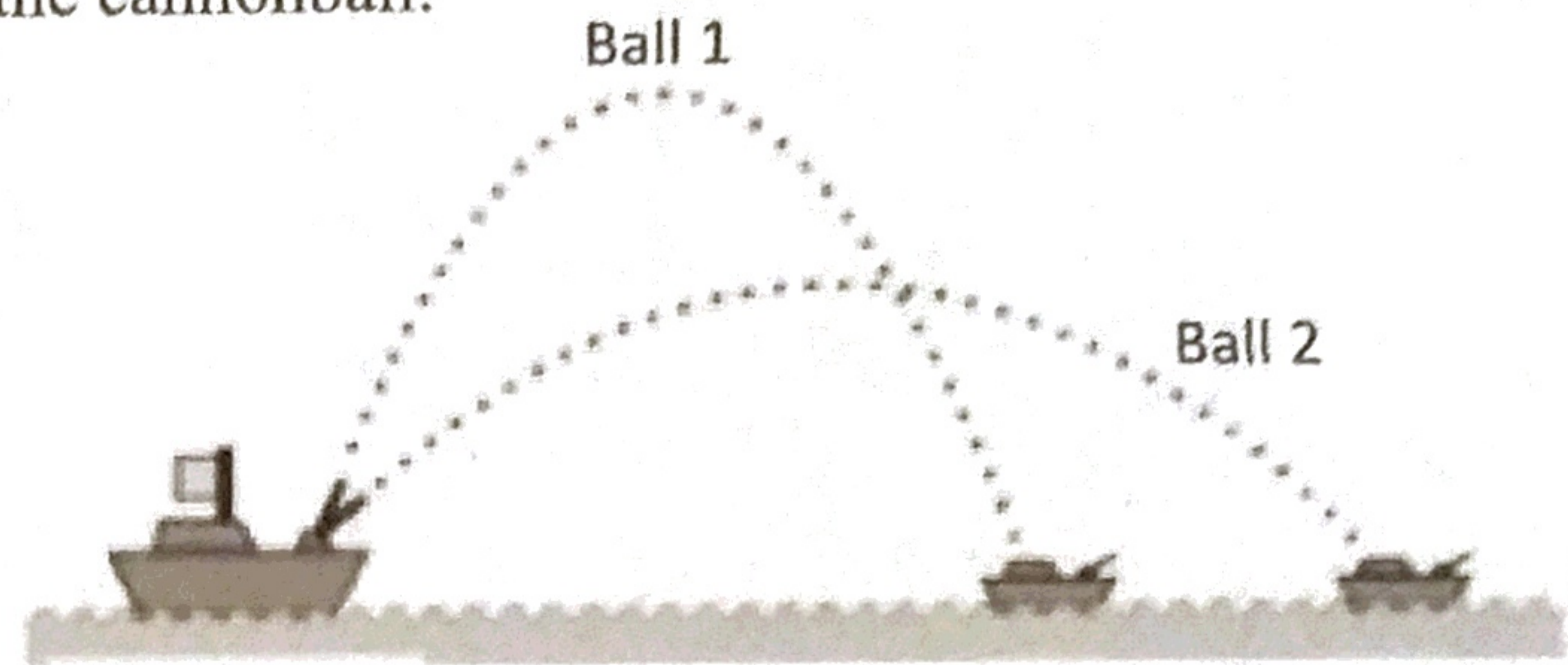
Ball 1

7. Which cannon ball traveled further?

Ball 2

8. Which cannon ball was in the air longer?

No way of telling b/c time was not one of the measured variables.



A teacher made a class project where students were virtually sling-shotting an angry bird onto a pig target located at (9,2) by transforming the parent function $f(x) = x^2$.

9. Which student sent their angry bird the highest?

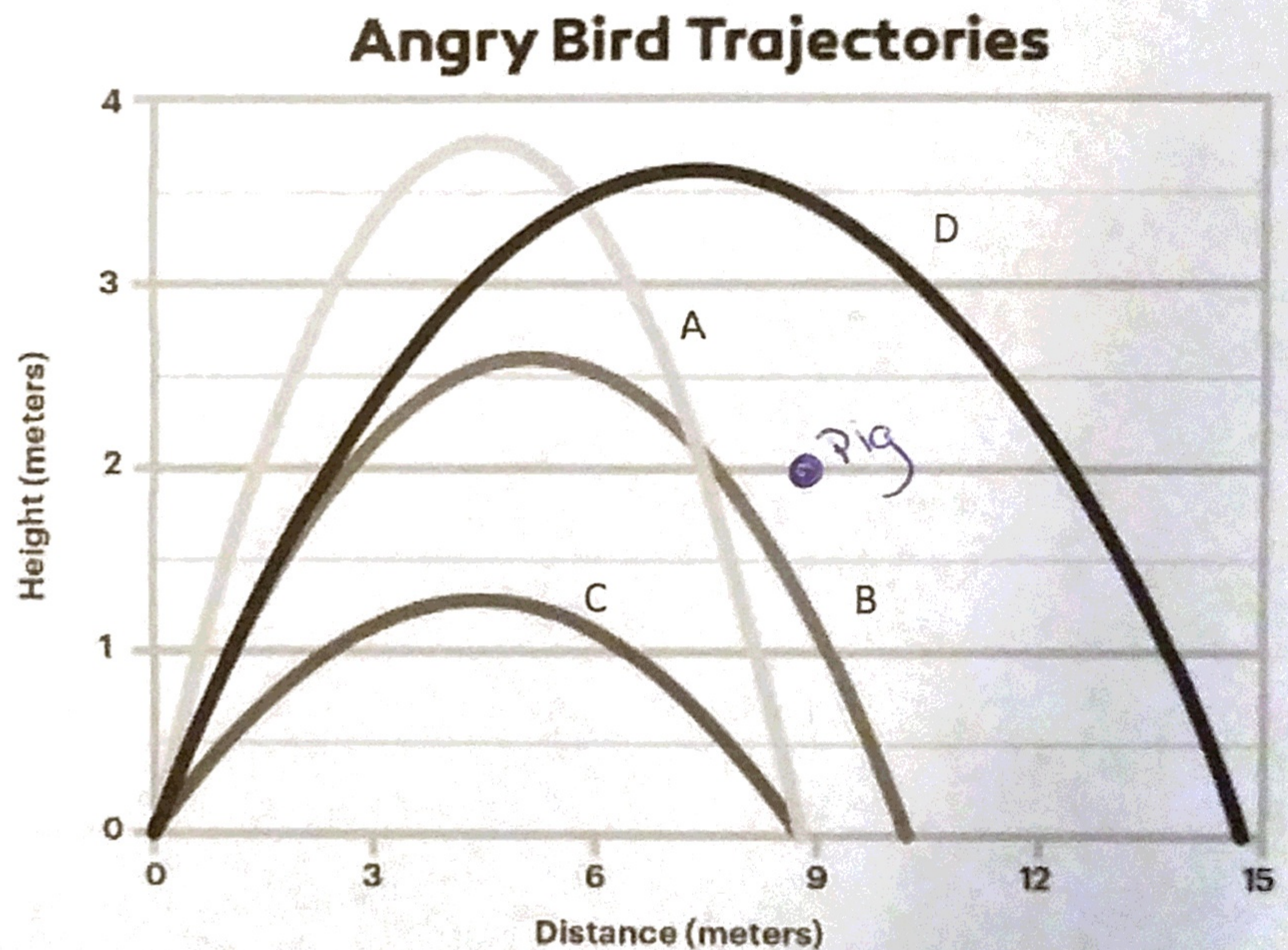
Student A

10. Which student sent their angry bird the farthest?

Student D

11. Which student came closest to hitting the pig target?

Student B



12. Which student's angry bird was in the air the longest?

No way of telling b/c time was not a measured variable.