Name _____ **Date** _____ **Band** _____

Algebra 1 PBA Project 2015

"The Algebraic Edition"

You have learned about many different functions in Algebra 1—linear functions, absolute value functions, exponential functions, and quadratic functions. In this PBA project, you will demonstrate your understanding of writing equations, making tables, graphing function rules, and describing in words the behavior of each of the above functions by creating your own Angry Birds level.

Your level MUST include the following functions:

✓ ONE  Yellow Bird modeled by a linear function

✓ ONE  Green Bird modeled by an absolute value function

✓ ONE  Blue Bird modeled by an exponential function

✓ ONE  Red Bird modeled by a quadratic function

Your level MUST also include:

✓ ONE  King Pig set in your level that will be hit by your Red Bird AND your Yellow Bird

✓ ONE  Mustache Pig set in your level that will be hit by your Green Bird OR Blue Bird

You MUST decorate your level with an appropriate background and props. Play levels of the Angry Birds game for ideas and inspiration.

Please note that this PBA project is an INDEPENDENT activity. You are NOT to accept help from teachers, parents, students, tutors, or any other people. Any indication of cheating and/or plagiarism will result in a grade of ZERO with NO opportunity for a make up. However, you are encouraged to reference your notes, textbooks, classwork, homework, and any other materials that you think will be useful in completing your project.

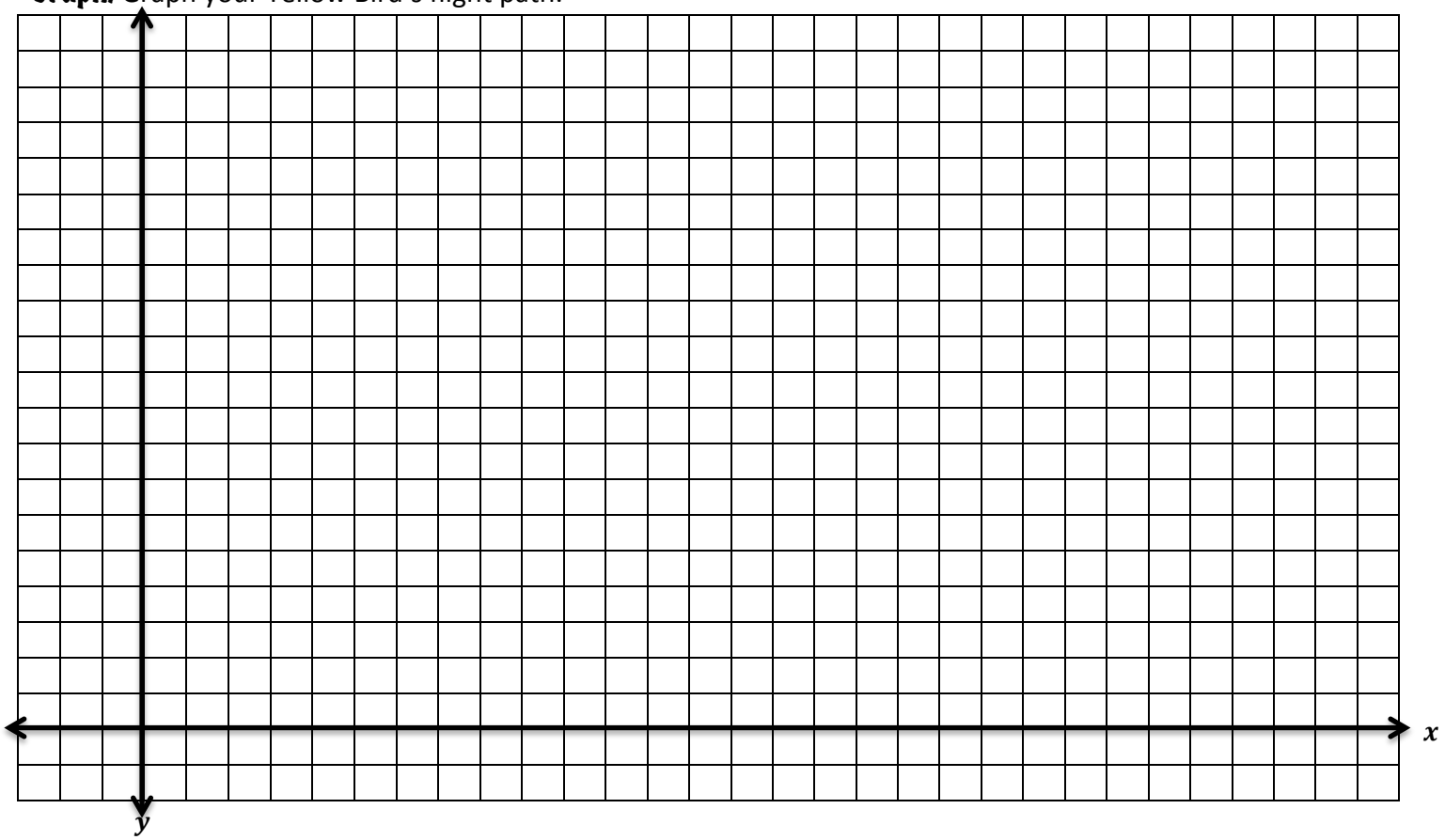
YOUR PBA PROJECT IS DUE ON _____ AS YOU WALK INTO CLASS. NO LATE PROJECTS WILL BE ACCEPTED. YOU HAVE BEEN WARNED!

Before your create a final draft of your level on page 6, you must create a first draft of each bird's flight path on pages 2-5 and answer questions about that function. You do not need to decorate these drafts, but you must complete each part to earn full credit.

On the due date of this project, you will also turn in a **poster** illustrating the level you create on page 6.

YELLOW BIRD DRAFT:

Graph: Graph your Yellow Bird's flight path.



Equation: Write an equation of your Yellow Bird's flight path.

Table: Make a table of values of your Yellow Bird's flight path.

x	y

Words: Why does a linear function best model Yellow Bird's flight path?

Yellow Bird Questions:

Answer all of the following questions in complete sentences.

1. What is the rate of change of the function? How is rate of change related to the slope?

2. What is the y-intercept of the function (if any)? How do you know that is the y-intercept?

3. What is the x-intercept of the function (if any)? How do you know that is the x-intercept?

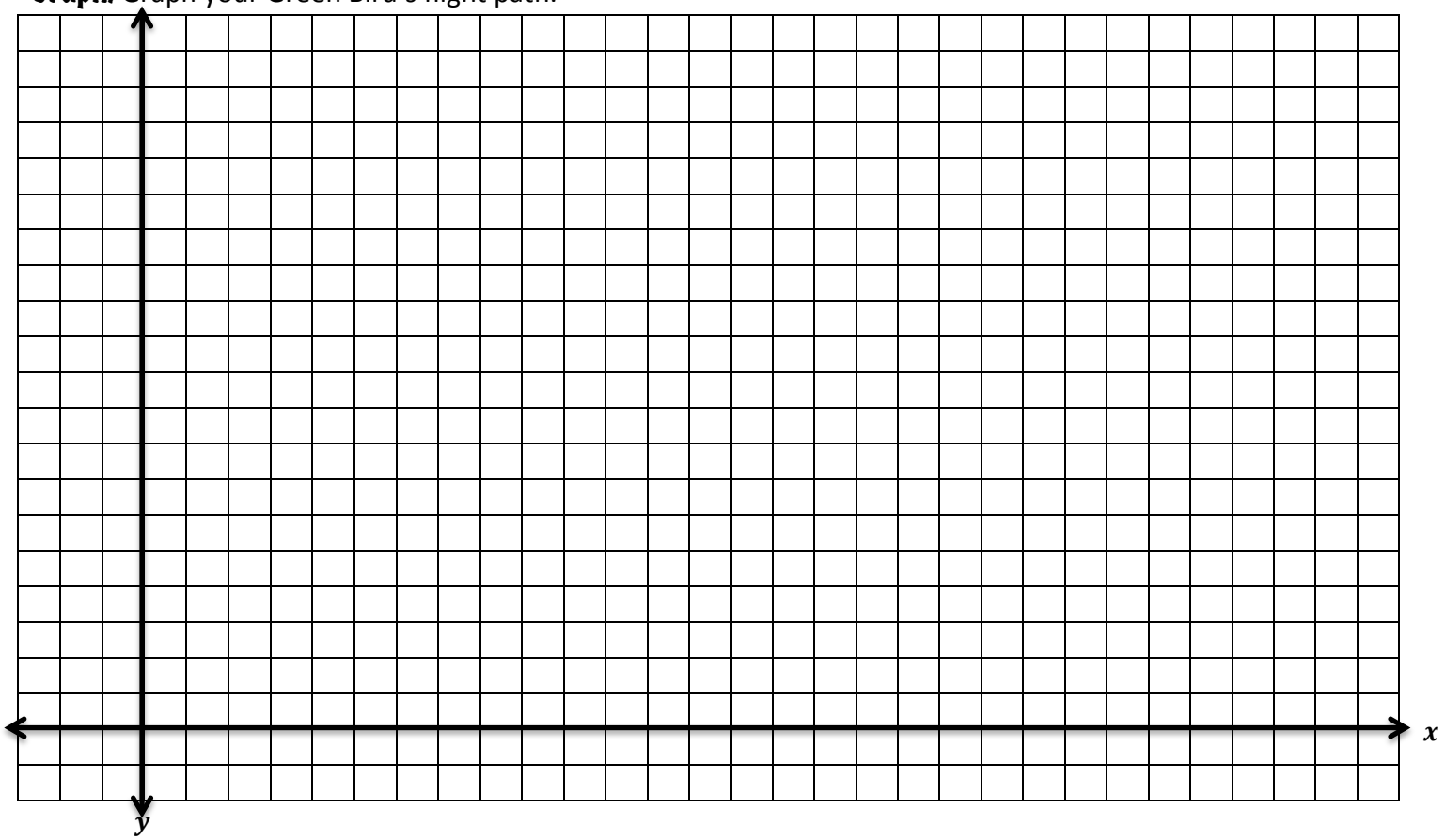
4. What is the domain of the function?

5. What is the range of the function?

6. Prove that Yellow Bird hits King Pig algebraically.

GREEN BIRD DRAFT:

Graph: Graph your Green Bird's flight path.



Equation: Write an equation of your Green Bird's flight path.

Table: Make a table of values of your Green Bird's flight path.

x	y

Words: Why does an absolute value function best model Green Bird's flight path?

Green Bird Questions:

Answer all of the following questions in complete sentences. 

1. What is the rate of change of the function?

2. What is the y-intercept of the function (if any)? How do you know that is the y-intercept?

3. What is (are) the x-intercept(s) of the function (if any)? How do you know that is the x-intercept?

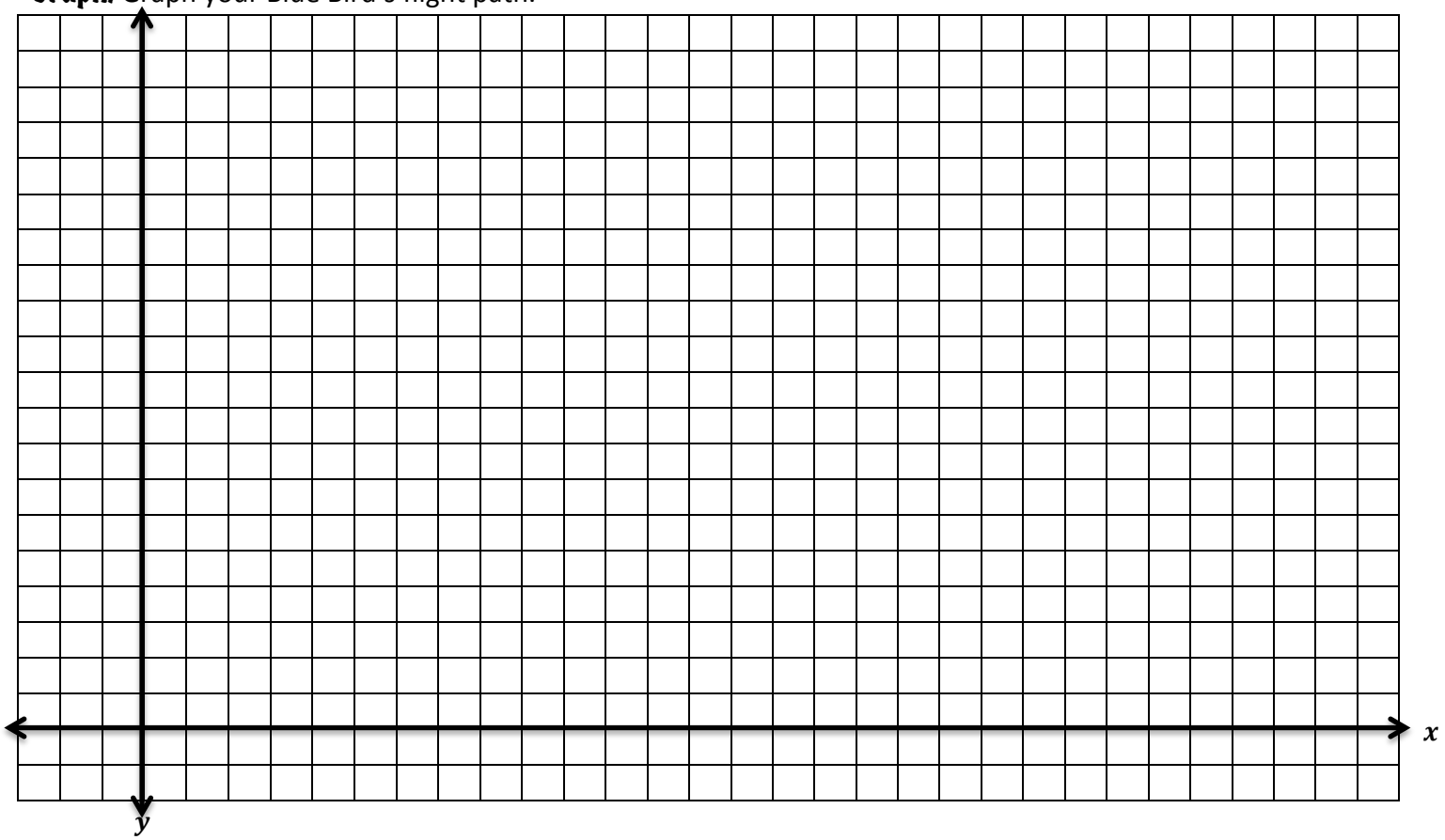
4. What is the domain of the function?

5. What is the range of the function?

6. (IF APPLICABLE) Prove that Green Bird hits Mustache Pig algebraically. 

BLUE BIRD DRAFT:

Graph: Graph your Blue Bird's flight path.



Equation: Write an equation of your Blue Bird's flight path.

Table: Make a table of values of your Blue Bird's flight path.

x	y

Words: Why does an exponential function best model Blue Bird's flight path?

Blue Bird Questions:

Answer all of the following questions in complete sentences.

1. What is the rate of change of the function?

2. What is the y-intercept of the function (if any)? How do you know that is the y-intercept?

3. What is the x-intercept of the function (if any)? How do you know that is the x-intercept?

4. What is the domain of the function?

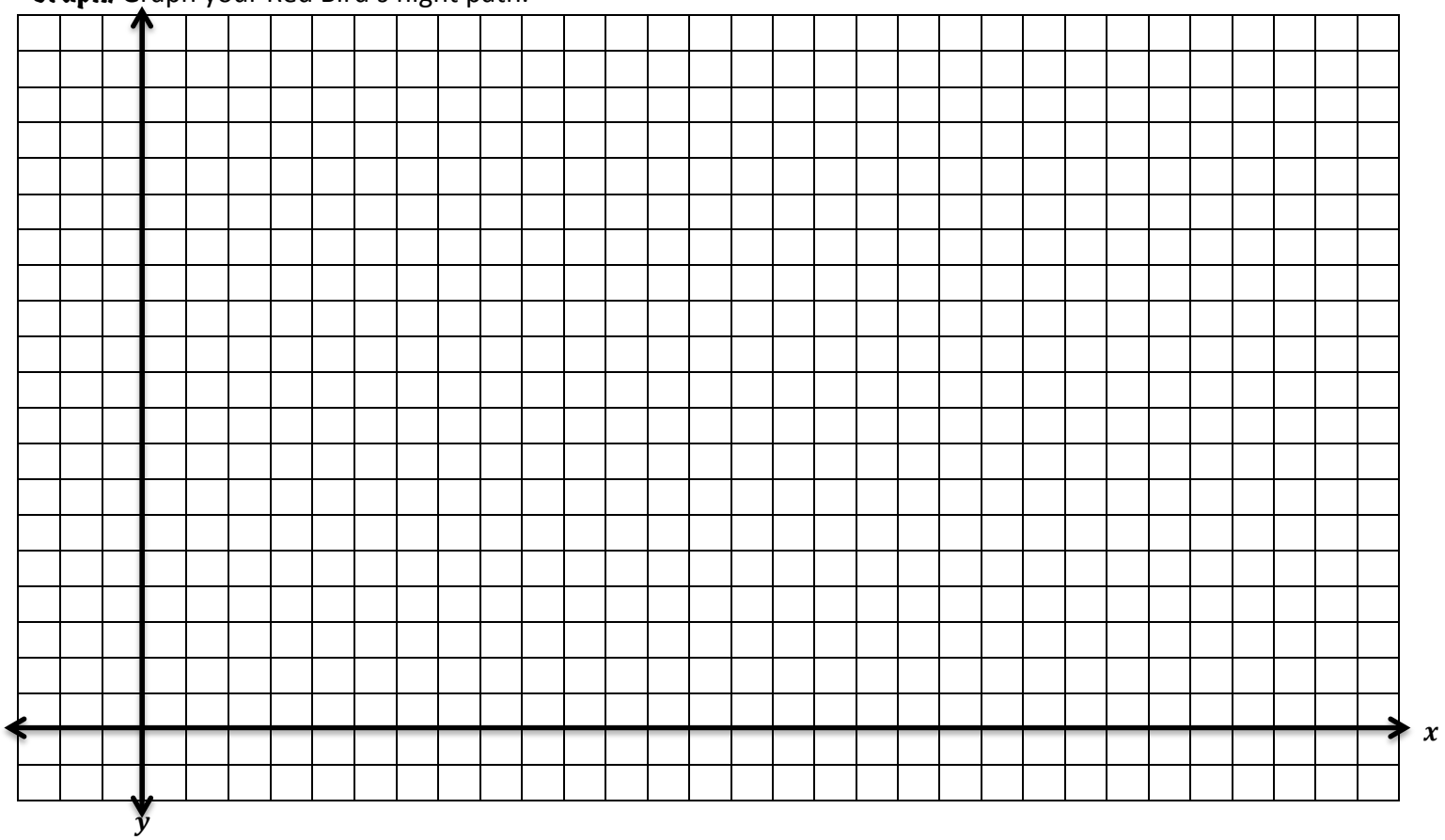
5. What is the range of the function?

6. Is Blue Bird's flight path modeled by exponential growth or exponential decay? How do you know?

7. (IF APPLICABLE) Prove that Blue Bird hits Mustache Pig algebraically. 

RED BIRD DRAFT:

Graph: Graph your Red Bird's flight path.



Equation: Write an equation of your Red Bird's flight path.

Table: Make a table of values of your Red Bird's flight path.

x	y

Words: Why does a quadratic function best model Red Bird's flight path?

Red Bird Questions:

Answer all of the following questions in complete sentences. 

1. What is the vertex of the function? Is the vertex a maximum of minimum? What is the axis of symmetry of the function?

2. What is the y-intercept of the function (if any)? How do you know that is the y-intercept?

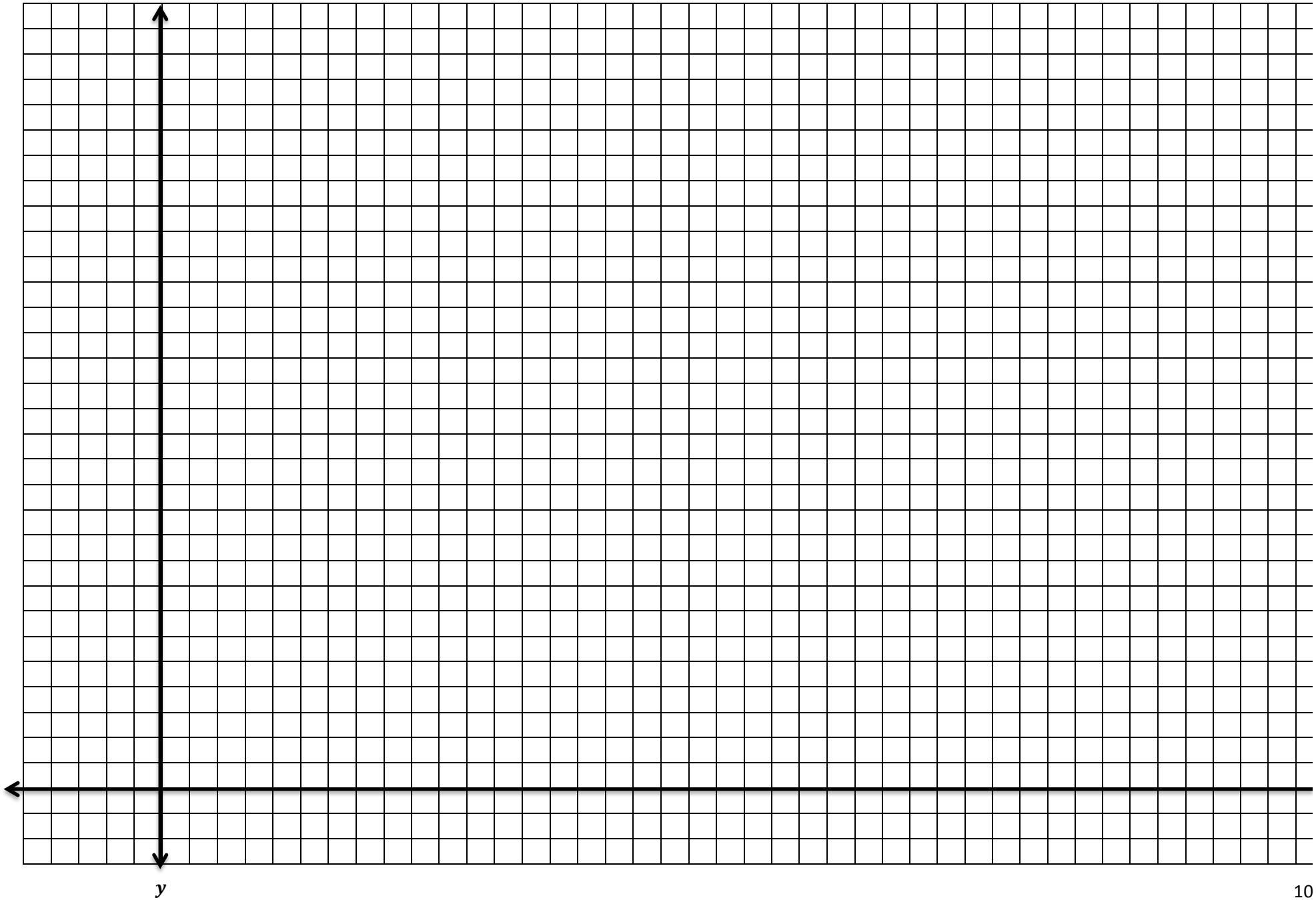
3. What is(are) the x-intercept(s) of the function (if any)? How do you know that is the x-intercept?

4. What is the domain of the function?

5. What is the range of the function?

6. Prove that Red Bird hits King Pig algebraically. 

ANGRY BIRDS LEVEL: Graph ALL your bird's flight paths and clearly label each function with its equation. Include all decorations (background and props).



Grading Rubric:

CATEGORY	4	3	2	1
Completion	All problems are completed.	All but one of the problems are completed.	All but two of the problems are completed.	Several of the problems are not completed.
Neatness and Attractiveness	Exceptionally well designed, neat, and attractive. Colors that go well together are used to make the graph more readable.	Neat and relatively attractive.	Lines are neatly drawn but the graph appears quite plain.	Appears messy and "thrown together" in a hurry. Lines are visibly crooked.
Strategy/ Procedures	Typically, uses an efficient and effective strategy to solve the problem(s).	Typically, uses an effective strategy to solve the problem(s).	Sometimes uses an effective strategy to solve problems, but does not do it consistently.	Rarely uses an effective strategy to solve problems.
Diagrams and Sketches	Diagrams and/or sketches are clear and greatly add to the reader's understanding of the procedure(s).	Diagrams and/or sketches are clear and easy to understand.	Diagrams and/or sketches are somewhat difficult to understand.	Diagrams and/or sketches are difficult to understand or are not used.
Mathematical Concepts	Explanation shows complete understanding of the mathematical concepts used to solve the problem(s).	Explanation shows substantial understanding of the mathematical concepts used to solve the problem(s).	Explanation shows some understanding of the mathematical concepts needed to solve the problem(s).	Explanation shows very limited understanding of the underlying concepts needed to solve the problem(s) OR is not written.
Mathematical Errors	90-100% of the steps and solutions are correct.	Almost all (85-89%) of the steps and solutions are correct.	Most (70-84%) of the steps and solutions are correct.	Less than 70% of the steps and solutions are correct. OR There is no work to support the answers.

Comments: **Final Score:** **/ 24**