



Indiana Department of Education
SUPPORTING STUDENT SUCCESS

ISTEP+: Algebra I

End-of-Course Assessment

Released Items and Scoring Notes

Introduction

Indiana students enrolled in Algebra I participated in the *ISTEP+: Algebra I Graduation Examination* End-of-Course Assessment (ECA) during the 2009-2010 test administration windows. The Algebra I ECA consists of four item types which contribute to a student's scale score: multiple-choice, constructed response, gridded response and graphing items. It is important to keep in mind that a significant portion of a student's score is calculated from the multiple-choice items on the assessment, which are not addressed within this document.

This document consists of open-ended items from the Spring 2010 administration and includes:

- Sample released open-ended questions
- Rubrics used by trained evaluators to score student responses
- Sample papers used by trained evaluators to distinguish between rubric score point values
- Annotations describing the rationale for scoring student responses

The purpose of this guide is to provide additional Algebra I ECA sample items and to model the types of items that are scored using rubrics.

Reporting Category 2: Graphing and Interpreting Linear and Non-Linear Relations

Question 1

Jan is a photographer. She earns \$42.50 for each picture she sells. It costs Jan \$850.00 per month to maintain her photography lab.

Write an equation that represents the relationship between Jan’s monthly profit (P) and the number of pictures (x) she sells.

Answer _____

What does the x -intercept of the graph of the equation you found represent to Jan?

Exemplary Response:

• $P = 42.50x - 850$

Or other equivalent equation

And

- The x -intercept represents the minimum number of pictures Jan must sell each month to maintain her photography lab.

Or other acceptable response

Rubric:

2 points: Exemplary response.

1 point: One correct component. Correct equation in Part A or correct explanation in Part B.

0 points: Other

Question 1, Sample A – 2 points

Part A: $P = 42.50x - 850.00$

Part B: How many pictures she needs to sell to break even.

Notes: This response is equivalent to the exemplary response.

Question 1, Sample B – 1 point

Part A: $P = \$42.50x - \850.00

Part B: how much she has to pay to maintain her lab

Notes: This response shows a correct equation. However, the explanation is incorrect.

Question 1, Sample C – 0 points

Part A: $P = x + \$42.50$

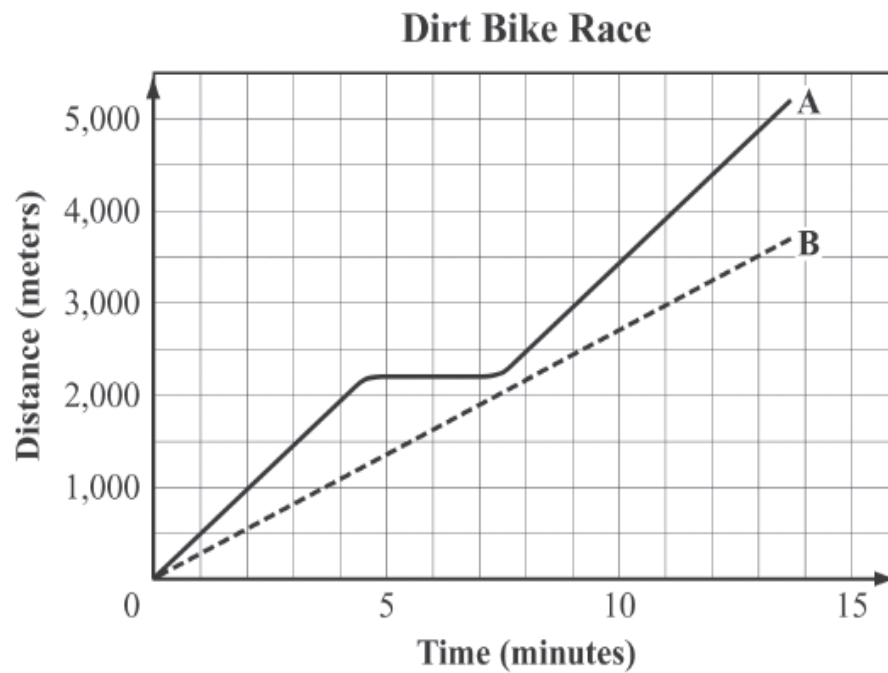
Part B: the x-intercept represents the number of pictures she sold

Notes: This response shows an incorrect equation and an incorrect explanation.

Reporting Category 2: Graphing and Interpreting Linear and Non-Linear Relations

Question 2

The graph below shows the progress of two bikers in a 5,000 meter dirt bike race.



Describe Racer A's speed between minutes 5 and 7.

Describe Racer B's speed between minutes 5 and 7.

Exemplary Response:

- Racer A is traveling at a speed of 0 meters per minute; or Racer A has stopped (or fallen).

Or other equivalent response

And

- Racer B is traveling at a constant speed.

Or other equivalent response

Rubric:

2 points: Exemplary response. Correctly describes the speed of both Racers.

1 point: One correct component. Correctly describes the speed of Racer A or Racer B.

0 points: Other

Question 2, Sample A – 2 points

Part A: He stopped.

Part B: He continued at a steady pace.

Notes: This response is equivalent to the exemplary response.

Question 2, Sample B – 1 point

Part A: stopped completely.

Part B: they kept going. Racer B kept going and did not stop.

Notes: This response gives a correct description of Racer A's speed, however, the description of Racer B's speed is incorrect.

Question 2, Sample C – 0 points

Part A: Racer A's speed would go up or down. At about 2,500 he slowed down.

Part B: Racer B never slowed down and just accelerated.

Notes: This response gives two incorrect descriptions.

Reporting Category 5: Solving and Graphing Quadratic Equations

Question 3

The length of a rectangle is $(x + 2)$ inches. The width of the rectangle is $(x + 1)$ inches.

Write an equation that can be used to determine the area (A) of the rectangle in terms of x .

Answer _____

What is the value of x if the area of the rectangle is 56 square inches?

Answer _____

Exemplary Response:

• $A = (x + 2)(x + 1)$

Or other equivalent equation, such as, $A = x^2 + 3x + 2$

And

• $x = 6$

Rubric:

2 points: Exemplary response.

1 point: One correct component. Or, a correct value of x based on an incorrect quadratic equation given in part A.

0 points: Other

Question 3, Sample A – 2 points

Part A: $A=(x+2)(x+1)$

Part B: 6 inches

Notes: This response is equivalent to the exemplary response.

Question 3, Sample B – 1 point

Part A: $A = x^2 + 3x + 2$

Part B: $x = -9, 6$

Notes: This response shows a correct equation, however, a value of $x = -9$ is shown in Part B which is incorrect.

Question 3, Sample C – 0 points

Part A: $x^2 + 3x + 3$

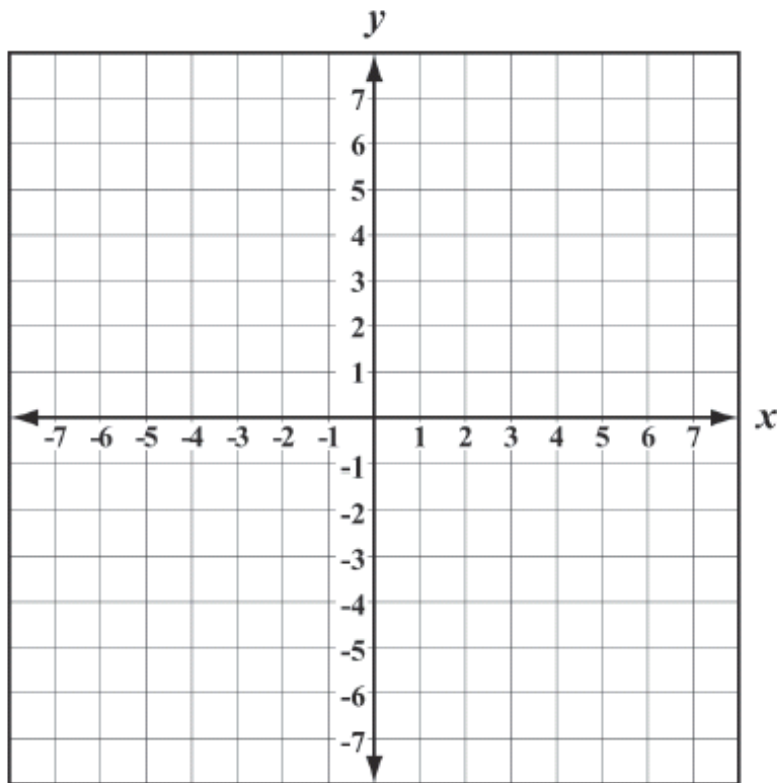
Part B: 56

Notes: This response shows an incorrect equation and an incorrect value of x .

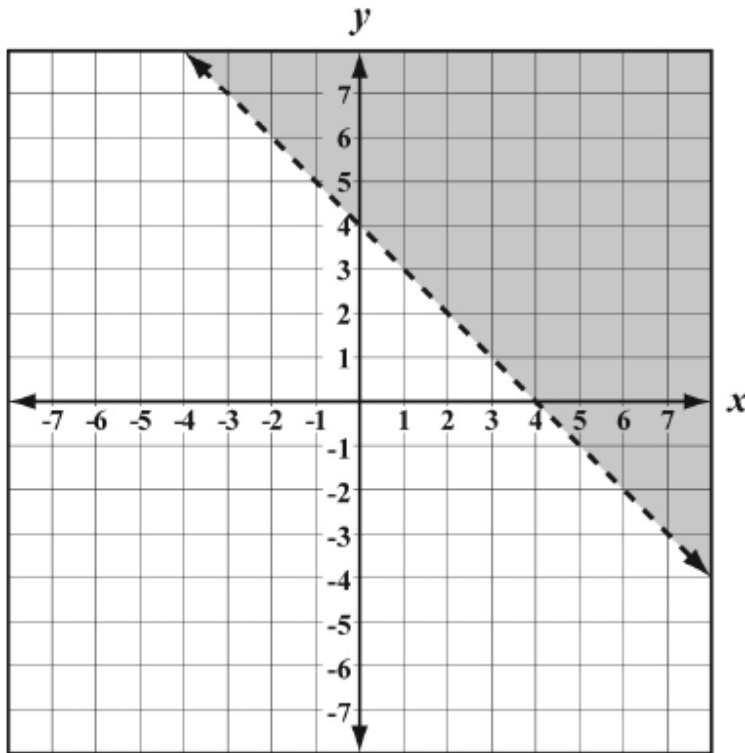
Reporting Category 2: Graphing and Interpreting Linear and Non-Linear Relations

Question 4

Graph the inequality $y > -x + 4$.



Exemplary Response:



Rubric:

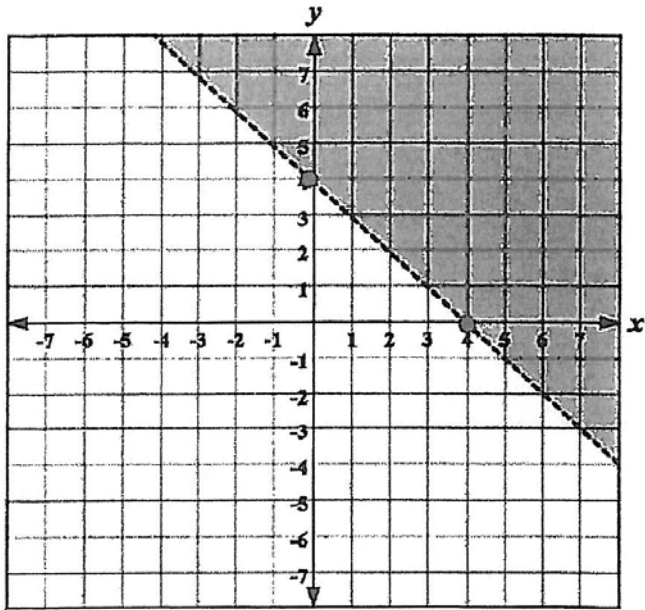
2 points: Exemplary response.

1 point: The graph of $y = -x + 4$ (using a solid line) with correct shading, incorrect shading, or no shading. Or, the graph of $y = -x + 4$ using a dashed line with incorrect shading or no shading. Or, an incorrect dashed line that is shaded correctly.

0 points: Other

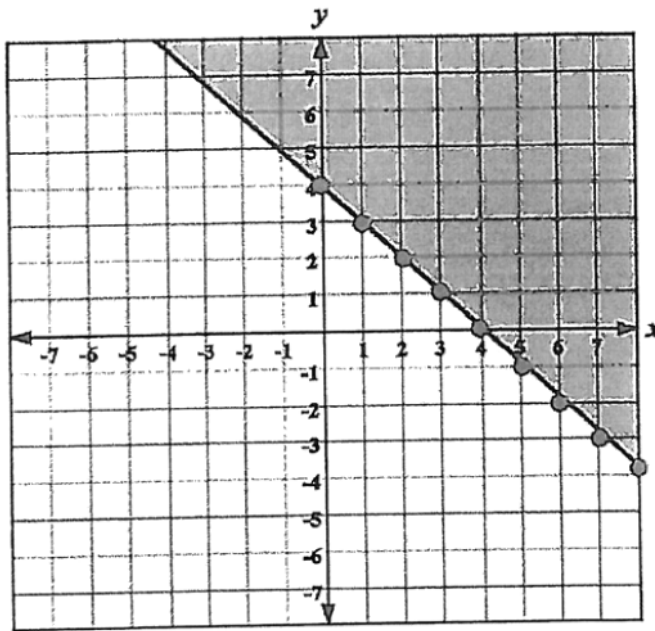
Note: No points will be awarded if more than 1 line is graphed or additional incorrect points are plotted.

Question 4, Sample A – 2 points



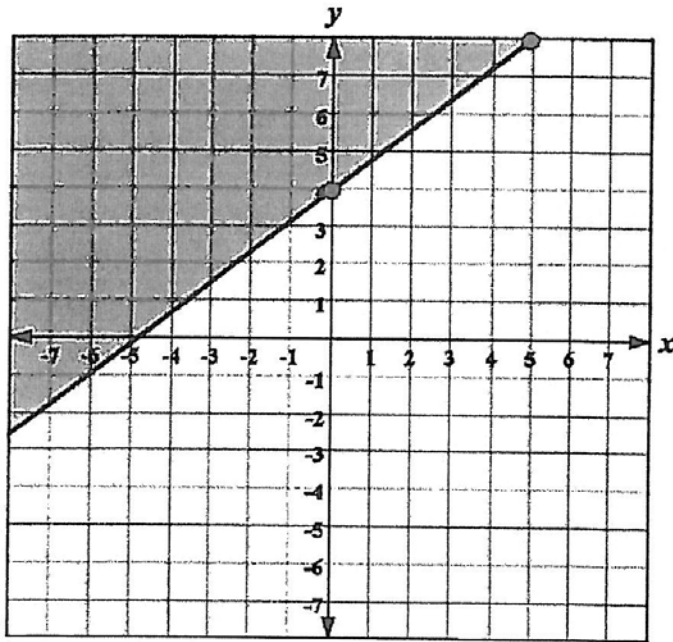
Notes: This response is equivalent to the exemplary response.

Question 4, Sample B – 1 point



Notes: This response shows the correct line of the equation $y = -x + 4$ and shows the correct shading. However, the line should be dashed. Therefore, this response receives 1 point.

Question 4, Sample C – 0 points



Notes: This response receives 0 points.