# RICAS Grade 8 Mathematics
# Paper-Based Practice Test Answer Key

## Session 1

| PBT Item No. | Standard | Item Type* | Max Points | Correct Answer** |
|---|---|---|---|---|
| 1 | 8.EE.A.3 | SR | 1 | D |
| 2 | 8.G.B.6 | SR | 1 | B |
| 3 | 8.SP.A.3 | SR | 1 | D |
| 4 | 8.EE.C.7 | SR | 1 | C |
| 5 | 8.F.A.1 | SR | 1 | D |
| 6 | 8.EE.C.7 | CR | 4 | *See page 2* |
| 7 | 8.NS.A.2 | SR | 1 | B,E |
| 8 | 8.EE.C.8 | SR | 1 | A |
| 9 | 8.F.A.2 | SR | 1 | B |
| 10 | 8.G.A.1 | SR | 2 | D;C |
| 11 | 8.NS.A.1 | SR | 1 | B,C,F |
| 12 | 8.EE.A.1 | SR | 1 | D |
| 13 | 8.G.B.8 | SR | 1 | B |
| 14 | 8.NS.A.2 | SR | 1 | B |
| 15 | 8.F.B.4 | CR | 4 | *See page 3* |
| 16 | 8.EE.A.2 | SR | 1 | A |
| 17 | 8.NS.A.1 | SR | 1 | C |
| 18 | 8.SP.A.2 | SR | 1 | D |
| 19 | 8.EE.A.4 | SR | 1 | B |
| 20 | 8.NS.A.1 | SR | 1 | C |

## Session 2

| PBT Item No. | Standard | Item Type* | Max Points | Correct Answer** |
|---|---|---|---|---|
| 21 | 8.EE.B.5 | SR | 1 | A |
| 22 | 8.G.C.9 | SR | 1 | B |
| 23 | 8.G.A.2 | SR | 1 | D |
| 24 | 8.G.A.1 | SA | 1 | 8 |
| 25 | 8.SP.A.4 | SR | 1 | B,D,E |
| 26 | 8.EE.C.8 | SR | 1 | D |
| 27 | 8.G.A.5 | CR | 4 | *See page 4* |
| 28 | 8.EE.B.6 | SR | 1 | D |
| 29 | 8.G.B.7 | SR | 1 | B |
| 30 | 8.F.A.3 | SR | 2 | C;B,D |
| 31 | 8.G.A.3 | SR | 1 | A |
| 32 | 8.EE.B.5 | SR | 1 | D |
| 33 | 8.G.A.4 | SR | 1 | D |
| 34 | 8.G.A.5 | SR | 1 | C,D,G |
| 35 | 8.G.B.8 | SR | 1 | C |
| 36 | 8.SP.A.1 | CR | 4 | *See page 5* |
| 37 | 8.F.A.1 | SR | 1 | D |
| 38 | 8.EE.B.5 | SR | 1 | B |
| 39 | 8.F.B.5 | SR | 1 | D |
| 40 | 8.EE.C.8 | SA | 1 | 270 |

*Mathematics item types are selected-response (SR), short-answer (SA), and constructed-response (CR).

**Answers are provided here for selected-response and short-answer items only. Pages 2–5 provide sample responses and scoring guidelines for constructed-response items.

## Scoring Guide for PBT Item #6: Constructed-Response Item

| Score | Description |
|---|---|
| 4 | The student response demonstrates an exemplary understanding of the Expressions and Equations concepts involved in solving linear equations in one variable. The student correctly determines the number of solutions of different equations. |
| 3 | The student response demonstrates a good understanding of the Expressions and Equations concepts involved in solving linear equations in one variable. Although there is significant evidence that the student was able to recognize and apply the concepts involved, some aspect of the response is flawed. As a result, the response merits 3 points. |
| 2 | The student response demonstrates a fair understanding of the Expressions and Equations concepts involved in solving linear equations in one variable. While some aspects of the task are completed correctly, others are not. The mixed evidence provided by the student merits 2 points. |
| 1 | The student response demonstrates a minimal understanding of the Expressions and Equations concepts involved in solving linear equations in one variable. |
| 0 | The student response contains insufficient evidence of an understanding of the Expressions and Equations concepts involved in solving linear equations in one variable. As a result, the response does not merit any points. |

## Sample Response:

The following are the most common correct answers. Other versions of the correct answers also receive credit.

### Part A

$x = 20$; $x = 16 + 4$; $x = 20$

### Part B

$2x + 4 = 2(x + 2)$; $2x + 4 = (2 \times x) + (2 \times 2)$; $2x + 4 = 2x + 4$; The equation simplifies to $4 = 4$, so the equation is true for any value of $x$, meaning there are infinitely many solutions.

### Part C

No solution; $3(4 + x) = 7x - 2(2x + 3)$; $12 + 3x = 7x - 4x - 6$; $12 + 3x = 3x - 6$; The equation simplifies to $12 = -6$, so the equation is false for any value of $x$, meaning there is no solution.

### Part D

One solution: $x = \frac{64}{7}$; $\frac{3}{8}x - 6 = \frac{1}{2}(4 - x)$; $\frac{3}{8}x - 6 = 2 - \frac{x}{2}$; $\frac{7}{8}x = 8$; $x = \frac{64}{7}$

## Scoring Guide for PBT Item #15: Constructed-Response Item

| Score | Description |
|---|---|
| 4 | The student response demonstrates an exemplary understanding of the Functions concepts involved in constructing a function to model a linear relationship between two quantities. The student correctly determines the y-intercept, rate of change, and equation from a table, and uses the equation to solve a problem. |
| 3 | The student response demonstrates a good understanding of the Functions concepts involved in constructing a function to model a linear relationship between two quantities. Although there is significant evidence that the student was able to recognize and apply the concepts involved, some aspect of the response is flawed. As a result, the response merits 3 points. |
| 2 | The student response demonstrates a fair understanding of the Functions concepts involved in constructing a function to model a linear relationship between two quantities. While some aspects of the task are completed correctly, others are not. The mixed evidence provided by the student merits 2 points. |
| 1 | The student response demonstrates a minimal understanding of the Functions concepts involved in constructing a function to model a linear relationship between two quantities. |
| 0 | The student response contains insufficient evidence of an understanding of the Functions concepts involved in constructing a function to model a linear relationship between two quantities. As a result, the response does not merit any points. |

## Sample Response:

The following are the most common correct answers. Other versions of the correct answers also receive credit.

### Part A

5; The y-intercept is the value of y when x = 0. From the table you can see this is 5.

### Part B

-2.5; slope is $m = \frac{7.5-10}{-1-(-2)} = \frac{-2.5}{1} = -2.5$ OR student may use any other pair of points from the table to calculate the slope

### Part C

$y = -2.5x + 5$

### Part D

Yes, the student is correct. I substituted the x value into the equation of the line and got the y value.

$-2.5(9) + 5 = -22.5 + 5 = -17.5$

## Scoring Guide for PBT Item #27: Constructed-Response Item

| Score | Description |
|---|---|
| 4 | The student response demonstrates an exemplary understanding of the Geometry concepts involved in using informal arguments to establish facts about the angle sum and exterior angle of triangles and the angle-angle criterion for similarity of triangles. The student correctly finds missing angle measures in a diagram and determines whether two triangles in the diagram are similar. |
| 3 | The student response demonstrates a good understanding of the Geometry concepts involved in using informal arguments to establish facts about the angle sum and exterior angle of triangles and the angle-angle criterion for similarity of triangles. Although there is significant evidence that the student was able to recognize and apply the concepts involved, some aspect of the response is flawed. As a result, the response merits 3 points. |
| 2 | The student response demonstrates a fair understanding of the Geometry concepts involved in using informal arguments to establish facts about the angle sum and exterior angle of triangles and the angle-angle criterion for similarity of triangles. While some aspects of the task are completed correctly, others are not. The mixed evidence provided by the student merits 2 points. |
| 1 | The student response demonstrates a minimal understanding of the Geometry concepts involved in using informal arguments to establish facts about the angle sum and exterior angle of triangles and the angle-angle criterion for similarity of triangles. |
| 0 | The student response contains insufficient evidence of an understanding of the Geometry concepts involved in using informal arguments to establish facts about the angle sum and exterior angle of triangles and the angle-angle criterion for similarity of triangles. As a result, the response does not merit any points. |

## Sample Response:

The following are the most common correct answers. Other versions of the correct answers also receive credit.

### Part A

70 degrees; $180 - (60 + 50) = 70$

### Part B

180 degrees; The measure of $\angle JMK$ is 70 degrees, and the measure of $\angle KML$ is equal to the sum of the measures of $\angle KJM$ and $\angle JKM$; $60 + 50 = 110$; $110 + 70 = 180$ OR equivalent

### Part C

37 degrees; $180 - (60 + 33) = 87$; $87 - 50 = 37$ OR equivalent

### Part D

The triangles are not similar. Two triangles are similar if they share two angle measures. The angle measures of triangle $JKL$ are 33, 60 ,and 87 degrees. The angle measures of triangle $KML$ are 33, 37, and 110. The triangles only have one angle measure in common.

## Scoring Guide for PBT Item #36: Constructed-Response Item

| Score | Description |
|---|---|
| 4 | The student response demonstrates an exemplary understanding of the Statistics and Probability concepts involved in interpreting a scatter plot for bivariate measurement data to investigate patterns of association between two quantities. Given a scatter plot, the student correctly determines if there are outliers in the data, describes the association represented by the data, and makes a prediction based on the data. |
| 3 | The student response demonstrates a good understanding of the Statistics and Probability concepts involved in interpreting a scatter plot for bivariate measurement data to investigate patterns of association between two quantities. Although there is significant evidence that the student was able to recognize and apply the concepts involved, some aspect of the response is flawed. As a result, the response merits 3 points. |
| 2 | The student response demonstrates a fair understanding of the Statistics and Probability concepts involved in interpreting a scatter plot for bivariate measurement data to investigate patterns of association between two quantities. While some aspects of the task are completed correctly, others are not. The mixed evidence provided by the student merits 2 points. |
| 1 | The student response demonstrates a minimal understanding of the Statistics and Probability concepts involved in interpreting a scatter plot for bivariate measurement data to investigate patterns of association between two quantities. |
| 0 | The student response contains insufficient evidence of the Statistics and Probability concepts involved in interpreting a scatter plot for bivariate measurement data to investigate patterns of association between two quantities. As a result, the response does not merit any points. |

## Sample Response:

The following are the most common correct answers. Other versions of the correct answers also receive credit.

### Part A

The high temperature on day $5$ is $45$°F.

### Part B

The high temperature on day 6 appears to be an outlier because it lies farthest away from the other data points OR because its value of $30$°F is much lower than the values of $45$°F and $46$°F that are immediately next to it. OR because it does not follow the general trend of the data. OR other valid explanations

### Part C

The data set has a positive association. The daily high temperature tends to increase as the number of days pass in January. OR other valid explanations

### Part D

The student is correct. The high temperature on the $15^{th}$ day should be greater than the high temperature for the $10^{th}$ day because the data show a positive association OR as a rule, the temperature on each day is greater than the temperature on prior days, therefore the high temperature on day 15 will be greater than the high temperature on day 10 OR other valid explanations