RICAS Grade 4 Mathematics
Paper-Based Practice Test Answer Key

Session 1

PBT Item No.	Standard	Item Type*	Max Points	Correct Answer**
1	4.OA.A.1	SR	1	C
2	4.NF.C.6	SR	1	A,E
3	4.NBT.B.5	SA	1	2800
4	4.MD.B.4	SR	1	B
5	4.G.A.1	SR	1	C
6	4.NF.A.2	CR	4	*See page 2*
7	4.OA.A.2	SR	1	A
8	4.MD.A.3	SA	1	15
9	4.MD.A.2	SR	1	C
10	4.NF.A.1	SR	1	C
11	4.NBT.B.4	SR	1	A
12	4.G.A.3	SR	1	D
13	4.NF.B.3	SR	1	D
14	4.OA.C.5	CR	4	*See page 3*
15	4.MD.C.5	SR	1	C
16	4.NBT.B.6	SR	1	A,D,E
17	4.G.A.2	SR	2	A,D;B
18	4.NF.B.4	SR	1	A
19	4.OA.A.3	SR	1	C
20	4.NBT.A.3	SR	1	B,C,E

Session 2

PBT Item No.	Standard	Item Type*	Max Points	Correct Answer**
21	4.NF.B.3	SR	1	B
22	4.MD.C.6	SR	1	D
23	4.NBT.A.1	SR	1	B
24	4.G.A.1	SR	1	B,D
25	4.NF.C.7	SR	1	B
26	4.OA.A.3	SR	1	B,E
27	4.MD.A.3	CR	4	*See page 4*
28	4.NF.C.5	SR	1	C,E
29	4.G.A.2	SR	1	B
30	4.NBT.A.2	SA	1	14205
31	4.OA.B.4	SR	1	B
32	4.MD.C.7	SR	1	A
33	4.NF.A.2	SR	1	A,E
34	4.OA.C.5	SR	1	C
35	4.NBT.B.5	CR	4	*See page 5*
36	4.NF.B.4	SR	1	B
37	4.MD.A.1	SR	1	C
38	4.NF.C.6	SA	2	0.54;C
39	4.NBT.B.4	SR	1	A
40	4.NF.A.1	SR	1	D

*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 of this document 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 Number and Operations - Fractions concepts involved in comparing two fractions with different numerators and different denominators, recognizing that the comparisons are valid only when the two fractions refer to the same whole, recording the comparisons with symbols and justifying the conclusions. The student correctly compares fractions, writes a comparison using symbols, and critiques the reasoning of others about different-sized wholes in a word problem.
3	The student response demonstrates a good understanding of the Number and Operations - Fractions concepts involved in comparing two fractions with different numerators and different denominators, recognizing that the comparisons are valid only when the two fractions refer to the same whole, recording the comparisons with symbols and justifying the conclusions. 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 Number and Operations - Fractions concepts involved in comparing two fractions with different numerators and different denominators, recognizing that the comparisons are valid only when the two fractions refer to the same whole, recording the comparisons with symbols and justifying the conclusions. 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 Number and Operations - Fractions concepts involved in comparing two fractions with different numerators and different denominators, recognizing that the comparisons are valid only when the two fractions refer to the same whole, recording the comparisons with symbols and justifying the conclusions.
0	The student response contains insufficient evidence of an understanding of the Number and Operations - Fractions concepts involved in comparing two fractions with different numerators and different denominators, recognizing that the comparisons are valid only when the two fractions refer to the same whole, recording the comparisons with symbols and justifying the conclusions. 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

$\frac{7}{8} > \frac{5}{6}$ or other valid inequality; if you change the fraction to have common denominators, then the numerator in $42/48$ is larger than the numerator in $\frac{40}{48}$.

Part B

Bucket C. $\frac{1}{2} = \frac{3}{6}$ and $\frac{5}{6}$ is larger than $\frac{3}{6}$.

Part C

No. The two fractions are not from the same-sized whole. $\frac{5}{6}$ of the bigger bucket would be more than $\frac{5}{6}$ of the smaller bucket.

Part D

$\frac{1}{4}$ (or any fraction less than $\frac{1}{2}$). I know $\frac{1}{4}$ is less than $\frac{1}{2}$ because $\frac{1}{2}$ equals $\frac{2}{4}$ and $\frac{1}{4} < \frac{2}{4}$.

Scoring Guide for PBT Item #14: Constructed-Response Item

Score	Description
4	The student response demonstrates an exemplary understanding of the Operations and Algebraic Thinking concepts involved in generating a number or shape pattern that follows a given rule and identifies apparent features of the pattern that were not explicit in the rule itself. The student correctly determines the next step in a shape pattern, determines how many shapes will be in future steps, and understands relationships between different features of the pattern.
3	The student response demonstrates a good understanding of the Operations and Algebraic Thinking concepts involved in generating a number or shape pattern that follows a given rule and identifies apparent features of the pattern that were not explicit in the rule itself. 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 Operations and Algebraic Thinking concepts involved in generating a number or shape pattern that follows a given rule and identifies apparent features of the pattern that were not explicit in the rule itself. 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 Operations and Algebraic Thinking concepts involved in generating a number or shape pattern that follows a given rule and identifies apparent features of the pattern that were not explicit in the rule itself.
0	The student response contains insufficient evidence of an understanding of the Operations and Algebraic Thinking concepts involved in generating a number or shape pattern that follows a given rule and identifies apparent features of the pattern that were not explicit in the rule itself. 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

8

Part B

6; The number of squares is the same as the step number in the pattern.

Part C

18; The number of triangles is always twice as many as the step number of the pattern. So multiply the step number by 2 to find the number of triangles. $2 \times 9 = 18$ OR other valid explanation

Part D

32; The number of triangles is always twice the number of squares. $64 \div 2 = 32$ OR other valid explanation

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

Score	Description
4	The student response demonstrates an exemplary understanding of the Measurement and Data concepts involved in applying the area and perimeter formulas for rectangles in real world and mathematical problems. The student correctly determines the area of a rectangle given the length and width, determines the width given the area and length of a rectangle, critiques the reasoning of others about whether two rectangles with different areas can have the same perimeter, and solves a real-world problem involving rectangles with the same perimeter but with different areas.
3	The student response demonstrates a good understanding of the Measurement and Data concepts involved in applying the area and perimeter formulas for rectangles in real-world and mathematical problems. 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 Measurement and Data concepts involved in applying the area and perimeter formulas for rectangles in real-world and mathematical problems. 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 Measurement and Data concepts involved in applying the area and perimeter formulas for rectangles in real-world and mathematical problems.
0	The student response contains insufficient evidence of an understanding of the Measurement and Data concepts involved in applying the area and perimeter formulas for rectangles in real-world and mathematical problems. 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

32

Part B

7; $35 \div 5 = 7$ or $5 \times 7 = 35$

Part C

The owner is correct. The perimeter of the garden is 24 feet and the perimeter of the patio is also 24 feet. $(5 + 7) \times 2 = (4 + 8) \times 2$ OR other valid explanation

Part D

The length is 9 feet and the width is 3 feet. The perimeter of the flower bed has to be 24 feet and $9 + 9 + 3 + 3 = 24$ feet. Also, the area of the flower bed has to be less than 32 square feet, and $9 \times 3 = 27$ which is less than 32. OR other valid dimensions that have a perimeter of 24 feet and an area of less than 32 square feet.

Scoring Guide for PBT Item #35: Constructed-Response Item

Score	Description
4	The student response demonstrates an exemplary understanding of the Number and Operations in Base Ten concepts involved in multiplying a whole number of up to four digits by a one-digit number, and multiplying two two-digit numbers by using strategies based on place value and the properties of operations. The student correctly multiplies a whole number of up to four digits by a one-digit number and multiplies two two-digit numbers to solve real-world problems.
3	The student response demonstrates a good understanding of the Number and Operations in Base Ten concepts involved in multiplying a whole number of up to four digits by a one-digit number, and multiplying two two-digit numbers by using strategies based on place value and the properties of operations. 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 Number and Operations in Base Ten concepts involved in multiplying a whole number of up to four digits by a one-digit number, and multiplying two two-digit numbers by using strategies based on place value and the properties of operations. 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 Number and Operations in Base Ten concepts involved in multiplying a whole number of up to four digits by a one-digit number, and multiplying two two-digit numbers by using strategies based on place value and the properties of operations.
0	The student response contains insufficient evidence of an understanding of the Number and Operations in Base Ten concepts involved in multiplying a whole number of up to four digits by a one-digit number, and multiplying two two-digit numbers by using strategies based on place value and the properties of operations. 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

$95; 19 \times 5 = 95$

Part B

$4{,}560; 95 \times 48 = 4560$

Part C

$31{,}920; 4560 \times 7 = 31920$