Ohio Achievement Test
Grade 7 Mathematics

May 2008

Answer Key
and
Scoring Guidelines

Grade 7 Mathematics
Answer Key
May 2008

Item No.	Type	Content Standards	Content Standard Benchmark	Key
1	Multiple Choice	Number, Number Sense, and Operations	E	B
2	Multiple Choice	Measurement	D	Not for Public Release
3	Multiple Choice	Data Analysis and Probability	G	D
4	Multiple Choice	Patterns, Functions, and Algebra	B	Not for Public Release
5	Multiple Choice	Geometry and Spatial Sense	H	Not for Public Release
6	Short Answer	Data Analysis and Probability	H	2 pt rubric
7	Multiple Choice	Number, Number Sense, and Operations	H	B
8	Multiple Choice	Geometry and Spatial Sense	J	Not for Public Release
9	Multiple Choice	Patterns, Functions, and Algebra	E	Not for Public Release
10	Multiple Choice	Data Analysis and Probability	E	Not for Public Release
11	Extended Response	Geometry and Spatial Sense	I	Not for Public Release
12	Multiple Choice	Number, Number Sense, and Operations	H	Not for Public Release
13 – 18	**Field Test Items Not Used in Student Score**			
19	Multiple Choice	Measurement	D	Not for Public Release
20	Multiple Choice	Data Analysis and Probability	A	A
21	Short Answer	Patterns, Functions, and Algebra	B	Not for Public Release
22	Multiple Choice	Number, Number Sense, and Operations	I	C
23	Multiple Choice	Geometry and Spatial Sense	G	A
24	Multiple Choice	Data Analysis and Probability	H	Not for Public Release
25	Multiple Choice	Number, Number Sense, and Operations	H	C
26	Extended Response	Measurement	F	4 pt rubric
27	Multiple Choice	Patterns, Functions, and Algebra	I	Not for Public Release
28	Multiple Choice	Geometry and Spatial Sense	E	B
29	Multiple Choice	Measurement	C	C
30	Multiple Choice	Data Analysis and Probability	J	Not for Public Release
31	Short Answer	Number, Number Sense, and Operations	I	Not for Public Release
32	Multiple Choice	Patterns, Functions, and Algebra	L	A
33	Multiple Choice	Geometry and Spatial Sense	F	D
34	Multiple Choice	Number, Number Sense, and Operations	I	Not for Public Release
35	Multiple Choice	Patterns, Functions, and Algebra	H	C
36	Short Answer	Data Analysis and Probability	F	Not for Public Release
37	Multiple Choice	Number, Number Sense, and Operations	H	Not for Public Release
38	Multiple Choice	Measurement	A	B
39	Multiple Choice	Patterns, Functions, and Algebra	A	D
40	Multiple Choice	Number, Number Sense, and Operations	E	Not for Public Release
41	Short Answer	Patterns, Functions, and Algebra	C	Not for Public Release
42	Multiple Choice	Geometry and Spatial Sense	E	C
43	Multiple Choice	Measurement	E	D
44	Multiple Choice	Patterns, Functions, and Algebra	F	B
45	Multiple Choice	Number, Number Sense, and Operations	I	B

Limited = 0-9; Basic = 10-16; Proficient = 17-29; Accelerated = 30-36; Advanced = 37-50
Multiple Choice = 1 point; Short Answer = 2 points; Extended Response = 4 points

6. In your **Answer Document**, determine which girl has the greater probability of winning. Justify your answer by finding the probability for each girl. (**2 points**)

Scoring Guidelines

Points	Student Response
2 point	The focus of this task is computing the probability of compound events by using such methods as organized lists, tree diagrams and area models and determining who has the better chance of winning. The response shows work to determine the probability of each girl spinning her winning number and indicates that Abby has a greater chance of winning. 1 + 1 = 2 1 + 2 = 3 1 + 3 = 4 1 + 4 = 5 1 + 5 = 6 3 + 1 = 4 3 + 2 = 5 3 + 3 = 6 — Abby wins 3 + 4 = 7 3 + 5 = 8 5 + 1 = 6 5 + 2 = 7 — Brittany wins 5 + 3 = 8 5 + 4 = 9 5 + 5 = 10 There are 15 possible combinations for the two spinners. $\frac{3}{15}$ add up to 6 and $\frac{2}{15}$ add up to 8. Abby's probability of winning is greater. 1 → 1 = 2, 2 = 3, 3 = 4, 4 = 5, 5 = 6 3 → 1 = 4, 2 = 5, 3 = 6, 4 = 7, 5 = 8 5 → 1 = 6, 2 = 7, 3 = 8, 4 = 9, 5 = 10 Abby's chances of getting a 6 are 3 out of 15, and Brittany's chances of getting an 8 are 2 out of 15, so Abby has the greater probability of winning. **1** 2 3 4 5 6 **3** 4 5 6 7 8 **5** 6 7 8 9 10

	Abby's chances of getting a 6 are $\frac{3}{15}$, and Brittany's chances of getting an 8 are $\frac{2}{15}$, so Abby has a better chance of winning.
1 point	The response shows partial evidence of computing the probability of compound events by using such methods as organized lists, tree diagrams and area models; however, the solution may be incomplete or slightly flawed. The response may: • Provide the correct probabilities and the correct answer without showing work. • Provide an appropriate and accurate strategy for finding the probability, but fail to state the probability of each person winning and to name Abby as the more likely winner. • Show an appropriate diagram with an error that leads to an incorrect conclusion (i.e., both girls have a $\frac{2}{15}$ chance of winning), but complete all parts of the problem.
0 point	The response provides inadequate evidence of computing the probability of compound events by using such methods as organized lists, tree diagrams and area models. The response provides major flaws in explanations or irrelevant information. The response may: • State only that Abby has a greater probability of winning. • Restate the information provided in the item. • Be blank or give irrelevant information.

26. In your **Answer Document**, determine how many cubic inches of stuffing Carson will need to make the pillow. Show your work. Before he started making the pillow, Carson decided he wanted to make it bigger. Compare the amount of stuffing needed when he doubles the length to the amount of stuffing needed when he doubles the diameter. Show work or provide an explanation to support your comparison. (**4 points**)

Scoring Guidelines

Points	Student Response
4 point	The focus of the task is finding the volume of a three-dimensional cylindrical object and describing changes in the volume of a three-dimensional object when the measurements of the object are changed. The response provides a correct strategy to find the number of cubic inches of stuffing Carson will need to make the pillow **AND** a comparison of the amount of stuffing needed when Carson doubles the length to the amount of stuffing needed when he doubles the diameter. The response also shows or explains all calculations. **Sample Response**: **Work for 6-inch diameter pillow:** $V = \pi r^2 h$ $V = \pi x 3^2 x 15$ $V = 424.12$ in^3 Carson needs 424.12 in^3 of stuffing for the 6-inch diameter pillow **Work for 12-inch diameter pillow (doubles diameter):** $V = \pi r^2 h$ $V = \pi x 6^2 x 15$ $V = 1696.46$ in^3 Carson needs 1696.46 in^3 of stuffing for the 12-inch diameter pillow **Work for the 30-inch long pillow (doubles the length):** $V = \pi r^2 h$ $V = \pi x 3^2 x\ 30$ $V = 848.23$ in^3 1696.46 / 848.23 = 2 Carson would only need $\frac{1}{2}$ the amount of stuffing if he doubles the length compared to if he doubles the diameter **OR** The amount of stuffing needed for the larger pillow is more than the amount needed for the smaller pillow.
3 point	The response provides clear evidence of finding the volume of a three dimensional cylindrical object and describing changes in the volume of a three-dimensional object when the measurements of the object are changed; however, the solution is incomplete, slightly flawed with a minor calculation error. The response may: • Finds all three volumes correctly but makes no comparisons. • Makes a calculation error when finding volume (the same error may be carried out through all three volume calculations), and makes an accurate comparison based on those errors. Calculation errors include: • Not properly squaring the radius • Using the diameter instead of the radius but squares correctly. • Using $\pi \cdot d \cdot h$ or $2 \cdot \pi \cdot r h$ to find volume. Doubling the diameter.

2 point	The response provides partial evidence of finding the volume of a three-dimensional cylindrical object and describing changes in the volume of a three-dimensional object when the measurements of the object are changed; however, the solution is incomplete or slightly flawed. The response may: • Provides a correct strategy to find the number of cubic inches of stuffing Carson will need to make the original pillow, showing or explaining most calculations. • Provide a correct comparison of the amount of stuffing needed when Carson doubles the length to the amount of stuffing needed when he doubles the diameter, based on flawed calculations. • Provide a strategy to find the number of cubic inches of stuffing Carson will need to make the pillow **AND** a comparison of the amount of stuffing needed when Carson doubles the length to the amount of stuffing needed when he doubles the diameter; but, contains multiple calculation errors. • State for 12-inch-diameter pillow (doubled the diameter) $V = \pi d h$ $V = \pi x 12 x 15$ $V = 565.49 \text{ in}^3$ **For 30-inch-long pillow (doubles the length):** $V = \pi d h$ $V = \pi x 6 x 30$ $V = 565.49 \text{ in}^3$ 565.49/ 565.49 = 1 Carson would need the same amount of stuffing if he doubles the length instead of doubling the diameter.
1 point	The response provides minimal evidence of finding the volume of a three-dimensional cylindrical object and describing changes in the volume of a three-dimensional object when the measurements of the object are changed; however, the solution is incomplete or flawed. The response may: • Provide a partially correct strategy to find the number of cubic inches of stuffing Carson will need to make the pillow with multiple calculation errors and no comparison. Provide an inadequate comparison of the amount of stuffing needed when Carson doubles the length to the amount of stuffing needed when he doubles the diameter with multiple calculation errors.
0 point	The response provides inadequate evidence of finding the volume of a three-dimensional cylindrical object and describing changes in the volume of a three-dimensional object when the measurements of the object are changed. The response provides irrelevant information or major flaws in reasoning. The response may: • State that doubling the length is definitely going to be much larger than doubling the diameter because the length is a bigger number to begin with. • Be blank or make unrelated statements. Copy information from the stem.