

# MEA 2007–2008

## Mathematics Grade 8

The table below shows the entire MEA mathematics test design. Scores are based on common items only, half of which are released and can be found in this document.

### Test Design

CONTENT AREA	COMMON			EMBEDDED FIELD TEST			TOTAL ITEMS PER STUDENT			BASE TESTING TIME	POINTS
	MC	CR	SA	MC	CR	SA	MC	CR	SA		
MATHEMATICS	32	3	6	8	2	2	40	5	8	120 MIN.	56

Each item on the MEA measures a content standard and performance indicator based on Maine's 1997 *Learning Results*. Score points for items are accumulated and reported in clusters. Each content standard is included in a cluster as indicated below.

#### Mathematics Clusters

##### 1. Numbers and Operations

Numbers and Number Sense (A)  
Computation (B)

##### 3. Mathematical Decision Making

Data Analysis and Statistics (C)  
Probability (D)

##### 2. Shape and Size

Geometry (E)  
Measurement (F)

##### 4. Patterns

Patterns, Relations, and Functions (G)  
Algebra Concepts (H)  
Mathematical Communication (K)

### Item Information Chart

Please refer to the item information chart on the next page for in-depth information on each mathematics released item. The released item numbers in the chart correspond to item numbers in the practice test and on the MEA Class Analysis Report.

### Short-Answer and Constructed-Response Scoring Guides

A short-answer or constructed-response scoring guide includes score point descriptions used to determine the score. Training notes that follow the scoring guide provide in-depth descriptions or particular information also used to determine the score. At least one sample student response is provided for each score point with annotations that explain the reasoning behind the assigned score.

### Student Work

Student work samples to supplement these scoring guides are found in the file labeled "Student Work."

## Grade 8 Mathematics Released Item Information

Released Item Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Practice Test Page Number	2	2	2	3	5	5	5	5	6	6	6	6	7	7	7	7	8	8	8	9
Calculator	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Grade Level Expectation (GLE)	D4	B1	H4	B2	K2	H1	G3	A3	F1	G1	K2	C1	E2	D1	F1	K2	C1	H6	A3	E3
Cluster	3	1	4	1	4	4	4	1	2	4	4	3	2	3	2	4	3	4	1	2
Item Type	MC	MC	MC	CR	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	SA	SA	CR
Possible Points	1	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	4
Answer Key	C	A	B		B	C	A	A	C	B	C	C	D	C	C	B	C			
% Who Chose A or Earned 1 Point	3	50	40	28	9	18	52	55	18	26	21	14	17	10	16	40	14	5	14	21
% Who Chose B or Earned 2 Points	3	12	30	16	61	14	27	21	20	47	18	26	12	18	31	50	13	24	70	36
% Who Chose C or Earned 3 Points	87	30	14	10	21	62	13	12	56	16	42	50	15	65	37	8	55			13
% Who Chose D or Earned 4 Points	7	6	16	18	8	6	8	12	6	10	19	8	56	7	15	2	18			11
Statewide Average Student Score				1.62														0.53	1.54	1.74

**Calculator:** This row indicates whether use of a calculator is allowed for this item.

**Grade Level Expectation (GLE):** See “State of Maine 2007 Grade Level Expectations for Grades 3–8” document available at the Maine Department of Education’s Web site at <http://www.maine.gov/education/lsalt/gles.htm>.

**Cluster:** A group of content standards. (See previous page for groups.)

**Item Type:** MC = multiple-choice, SA = short-answer, CR = constructed-response

**Answer Key:** the letter of the correct answer choice

## Constructed-Response Item 4

- 4 Ms. Snider bought some ribbon for her craft club project. The ribbon came in packages that contained  $2\frac{3}{8}$  yards of ribbon each.
- Ms. Snider bought 2 packages of gold ribbon. What was the total number of yards of gold ribbon that she bought? Show or explain how you got your answer.
  - Ms. Snider needed 16 yards of silver ribbon for the project. What is the fewest number of packages of ribbon that she can buy and have enough ribbon for the project? Show or explain how you got your answer.
  - Ms. Snider used 16 yards of the silver ribbon. What was the total number of yards that she had left over? Show or explain how you got your answer.

### Scoring Guide for Constructed-Response Item 4

Score	Description
4	5 points
3	$4-4\frac{1}{2}$ points
2	2 (only if there are points in a or b)– $3\frac{1}{2}$ points
1	$\frac{1}{2}$ –2 points
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

## Training Notes for Constructed-Response Item 4

- Part a: 1 point correct answer ( $4\frac{3}{4}$  yards) with correct work/explanation  
OR  
 $\frac{1}{2}$  point correct answer  
OR  
 $\frac{1}{2}$  point correct explanation or strategy
- Part b: 2 points correct answer (7 packages) with correct work/explanation  
OR  
1 point gets  $6\frac{14}{19}$  but does not give whole number of packages  
OR  
1 point correct explanation or strategy
- Part c: 2 points correct answer ( $\frac{5}{8}$  yard) with correct work/explanation  
OR  
1 point gets  $16\frac{5}{8}$  and forgets to subtract 16 from it  
OR  
1 point correct explanation or strategy

### Sample Response:

$$2\frac{3}{8} \times 2 = \frac{19}{8} \times 2 = 4\frac{3}{4} \text{ yards OR } \frac{19}{4} \text{ yards}$$

She needed 7 packages

$$16 \div 2\frac{3}{8} = \frac{16}{1} \times \frac{8}{19} = \frac{128}{19} = 6\frac{14}{19}, \text{ so she needs 7 packages}$$

$$7(2\frac{3}{8}) = 7(\frac{19}{8}) = \frac{133}{8} = 16\frac{5}{8}$$

$$16\frac{5}{8} - 16 = \frac{5}{8} \text{ yards left over}$$

## Short-Answer Item 18

- 18 Solve for  $x$ .

$$10x + 5 = 3x - 23$$

Show your work or explain how you found your answer.

### Scoring Guide for Short-Answer Item 18

Score	Description
2	Student has the correct answer, $x = -4$ , AND work or explanation shows appropriate strategy.
1	Student has correct answer with no work or explanation given. OR Student work or explanation shows correct strategy was used to solve.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

### Training Notes for Short-Answer Item 18

$$10x + 5 = 3x - 23$$

$$7x = -28$$

$$x = -4$$

## Short-Answer Item 19

- 19 Jack said, “When you multiply two numbers (factors), the product is greater than either of the factors.”
- Write a multiplication sentence to show that Jack’s statement is true for some factors.
  - Write a multiplication sentence to show that Jack’s statement is false for some factors.

### Scoring Guide for Short-Answer Item 19

Score	Description
2	2 points
1	1 point
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

### Training Notes for Short-Answer Item 19

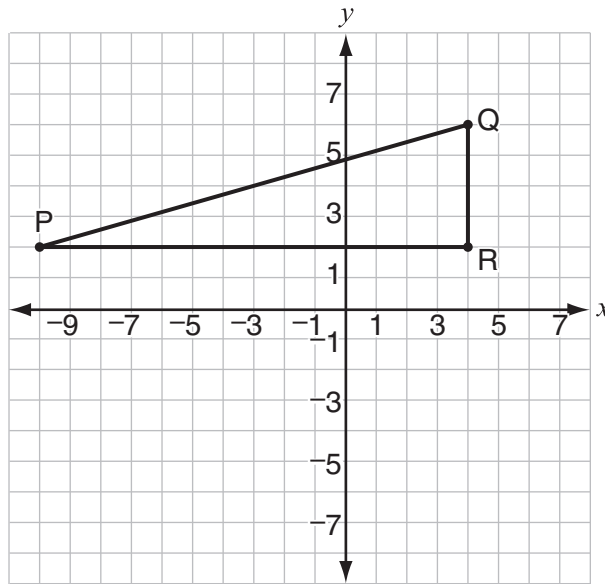
Score 1 point for each correct answer. Answers will vary. A sample of each answer follows.

Part a.  $3 \times 4 = 12$

Part b.  $\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$

## Constructed-Response Item 20

- 20 Triangle PQR is on the coordinate grid below.



- Using the grid above, locate the midpoint of segment QR and label it point M. Write the coordinates of point M in your answer booklet.
- Locate the midpoint of segment PR and label it point S. Write the coordinates of point S in your answer booklet.
- Locate the midpoint of segment PQ and label it point L. Write the coordinates of point L in your answer booklet.
- On the grid above, connect points L, M, and S to form triangle LMS. What is the area of triangle LMS? Show or explain how you found your answer.

### Scoring Guide for Constructed-Response Item 20

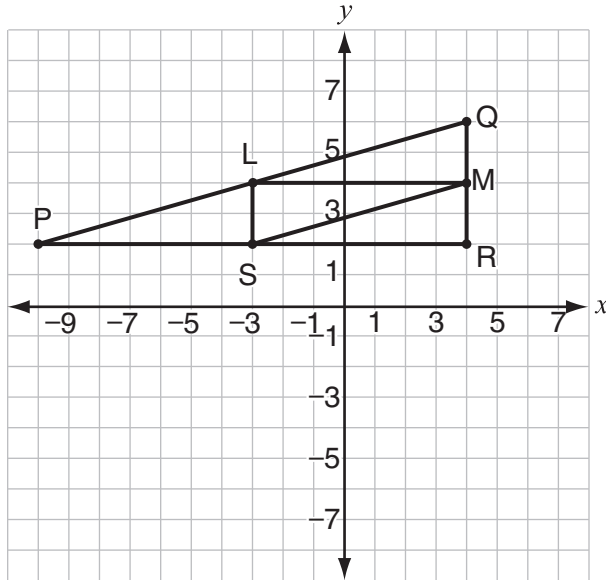
Score	Description
4	5 points
3	4 points
2	2 (only if there is a point in 2 parts) or 3 points
1	1–2 points OR A minimum understanding by correctly drawing triangle LMS.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
<b>Blank</b>	No response.

## Training Notes for Constructed-Response Item 20

Part a. 1 point (4, 4)

Part b. 1 point (-3, 2)

Part c. 1 point (-3, 4)



Part d. 2 points for the correct answer, 7 (sq. units), or correct answer based on incorrect parts a–c and work or explanation

$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2}(7)(2) = 7$$

**Note:** Students can count the base and height on the graph. Segment  $LM$  can be the base, and the vertical distance from  $L$  to  $S$  can be the height.

OR 1 point for the correct answer but inadequate or no work or explanation

OR 1 point for showing correct strategy in finding area of a triangle