

# MEA 2007–2008

## Mathematics Grade 6

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 grade level expectation 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)

##### 2. Shape and Size

Geometry (E)  
Measurement (F)

##### 3. Mathematical Decision Making

Data Analysis and Statistics (C)  
Probability (D)

##### 4. Patterns

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

### Item Information Chart

Please refer to the item information chart on page 3 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 6 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	2	3	3	3	4	6	6	6	6	7	7	7	8	8	8	8	9
Calculator	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Grade Level Expectation (GLE)	G1	B1	D4	A1	G3	F1	H6	B2	C1	E1	A1	C1	B2	G1	K2	F3	B2	D1	G1	E3
Cluster	4	1	3	1	4	2	4	1	3	2	1	3	1	4	4	2	1	3	4	2
Item Type	MC	MC	MC	MC	MC	MC	SA	CR	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	SA	CR
Possible Points	1	1	1	1	1	1	2	4	1	1	1	1	1	1	1	1	1	1	2	4
Answer Key	B	C	C	C	C	B			C	B	B	B	C	D	C	D	C	D		
% Who Chose A or Earned 1 Point	12	6	9	13	5	35	33	9	7	19	7	17	21	12	4	21	6	12	66	17
% Who Chose B or Earned 2 Points	75	30	4	35	8	51	46	38	25	68	53	60	16	17	17	49	11	7	18	23
% Who Chose C or Earned 3 Points	7	58	83	49	64	8		20	54	4	28	15	53	15	64	10	78	27		28
% Who Chose D or Earned 4 Points	6	5	5	2	23	7		6	14	9	11	7	11	56	15	19	6	53		6
Statewide Average Student Score							1.25	1.7											1.03	1.69

**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

## Short-Answer Item 7

7 Solve each equation.

a.  $q \times 12 = 180$

b.  $r \div 19 = 21$

### Scoring Guide for Short-Answer Item 7

Score	Description
2	Correct answer (a. 15 b. 399).
1	For 1 correct answer.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

## Constructed-Response Item 8

- 8 Ashley, Jane, and Cecilia ordered lunch from the menu shown below.

<b>Lunch Menu</b>			
<b>Food</b>		<b>Beverages</b>	
<b>Small Pizza</b>	<b>\$8.00</b>	<b>Bottled Water</b>	<b>\$1.25</b>
<b>Large Pizza</b>	<b>\$12.50</b>	<b>Tea</b>	<b>\$0.80</b>
<b>Salad</b>	<b>\$2.25</b>	<b>Soda</b>	<b>\$1.75</b>
<b>Soup</b>	<b>\$3.25</b>	<b>Lemonade</b>	<b>\$2.00</b>

- Ashley and Jane each order one lemonade.
- Cecilia orders soup and one bottled water.
- Ashley, Jane, and Cecilia order one large pizza to share.

All prices on the menu include tax.

- a. What is the total amount of the lunch bill? Show or explain how you found your answer.
- b. The girls decide to leave a tip of  $\frac{1}{5}$  of the total lunch bill. What is the amount of the tip? Show or explain how you found your answer.
- c. Jane wants to pay  $\frac{2}{3}$  of the total bill including the tip. How much will she pay? Show or explain how you found your answer.

### Scoring Guide for Constructed-Response Item 8

<b>Score</b>	<b>Description</b>
<b>4</b>	6 points Student demonstrates thorough fluency in computing and estimating.
<b>3</b>	4 or 5 points Student demonstrates general fluency in computing and estimating, with only a minor error or omission.
<b>2</b>	2 or 3 points Student demonstrates basic fluency in computing and estimating.
<b>1</b>	1 point Student demonstrates minimal fluency in computing and estimating.
<b>0</b>	0 points 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 8

- Part a: 2 points for correct answer, **\$21**, with work shown or explanation given  
OR  
1 point for correct answer, no work shown or explanation given  
or  
1 point for correct strategy shown in solving problem, but incorrect answer
- Part b: 2 points for correct answer, **\$4.20**, with work shown or explanation given  
OR  
1 point for correct answer, no work shown or explanation given  
or  
1 point for correct strategy shown in solving problem, but incorrect answer
- Part c: 2 points for correct answer, **\$16.80**, with work shown or explanation given  
OR  
1 point for correct answer, no work shown or explanation given  
or  
1 point for correct strategy shown in solving problem, but incorrect answer

### Sample Response:

Part a: Total bill: \$21.00

$$3.25 + 1.25 + 2(2.00) + 12.50 = 4.50 + 4.00 + 12.50 = 21.00$$

Part b: The tip should be: \$4.20

$$\frac{1}{5} \times 21 = \frac{21}{5} \quad 21 \div 5 = 4.20$$

Part c:  $\$21.00 + \$4.20 = \$25.20$   $\frac{2}{3}$  of \$25.50 is  $2 \times 25.50 = 50.40 \div 3 = \$16.80$

**Note:** Answers that are correct based on errors made in an earlier part(s) are scored as correct.

## Short-Answer Item 19

- 19 Heather bought a jewelry box and some bracelets. The costs for the items are listed below.
- jewelry box: \$15
  - bracelets: \$3 each
- a. What is the total cost of 1 jewelry box and 6 bracelets?
- b. Write an expression to show the total cost of two jewelry boxes and  $b$  bracelets.

### Scoring Guide for Short-Answer Item 19

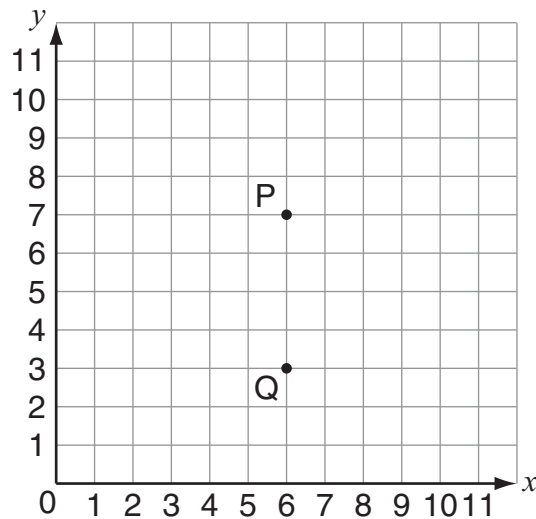
Score	Description
2	Correct answers (a. \$33, b. $30 + 3b$ or $3b + 30$ ).
1	One part is correct.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

### Training Notes for Short-Answer Item 19

- a.  $3 \times 6 + 15 = 33$
- b.  $30 + 3b$  or  $3b + 30$  or equivalent ( $2 \times 15 + 3b$ )

## Constructed-Response Item 20

- 20 Chris plotted point P and point Q on a coordinate grid, as shown below.



- a. What are the coordinates of point P?

Chris wants to draw a right triangle on the coordinate grid using point P and point Q as vertices.

- b. Name the coordinates of a third point Chris could use to draw a right triangle.

Using point P and point Q, Chris wants to draw a different triangle that is congruent to the triangle in part b.

- c. Name the coordinates of a new point Chris could use to draw a triangle congruent to the triangle in part b. Explain or show how you know that the new triangle will be congruent to the one in part b.

### Scoring Guide for Constructed-Response Item 20

Score	Description
4	4 points
3	3 points
2	2 points
1	1 point OR Student shows minimal understanding of the problem.
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 20

Part a: 1 point for correct answer (6, 7)

Part b: 1 point for correct answer (coordinates for the  $y$ -axis [3 or 7] and  $x$ -axis [0 thru 5 or 7 thru 11])

Part c: 2 points for correct answer (coordinates for the  $y$ -axis will be the  $y$ -axis not used in part b [3 or 7] and the same  $x$  coordinate used in part b) with sufficient explanation given

OR

1 point for correct answer with insufficient explanation given

OR

1 point for sufficient reasoning shown in solving the problem, but incorrect answer

### Sample Responses:

Part a: Point P is located at (6, 7).

Part b: Point Q is located at (4, 3).

Part c: To make a congruent triangle, plot another point at (4, 7); it is a right triangle and the same size as the triangle in part b.