

# MeTEOR Performance Task Eighth Grade

Mathematics  
Equations and Proportionality



## **Performance Task Item: Expressions and Equations**

Grade Level: 7<sup>th</sup> grade

**Focus Area:** Writing and Solving Simple Expressions and Equations

**Essential Question:** What strategies can be used to distinguish between simple expressions and equations?

**Core Ideas:**

- Understands that variables can be used to represent numbers in any type mathematical problem.
- Understands the difference of an expression and an equation.

**Learning Targets:**

- Students will understand the difference between equations and expressions.
- Students will solve real-life and mathematical problems using numerical and algebraic expressions and equations.
- Students will explain their reasoning.

## **STANDARDS**

**Domain: Expressions and Equations**

**Content Standards:**

- Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
- Understand that rewriting an expression in different forms in a problem context can clarify the problem and how the quantities in it are related.
- Use variables to represent quantities in a real-world or mathematical problem, and construct simple expressions and equations.
- Solve word problems leading to equations of the form  $px + q = r$  and  $p(x + q) = r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers. Solve equations of these forms fluently.

**Supporting Standards:**

- Solve multistep real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals) by applying properties of operations as strategies to calculate with numbers, converting between forms as appropriate, and assessing the reasonableness of answers using mental computation and estimation strategies.

**Math Practice Standards:**

MP 1: Make sense of problems and persevere in solving them.

MP 3: Construct viable arguments and critique the reasoning of others.

MP 4: Model with mathematics.

MP 6: Attend to precision.

MP 7: Look for and make use of structure.

**Materials:**

- Performance Task
- Pencil
- Paper
- Calculator

***Task/Question 1:***

**DOK Level 1:** Recall & Reproduction

**Math Practice Standard:**

- MP 6: Attend to precision.
- A.** Define a mathematical expression:
- B.** Define a mathematical equation:
- C.** What is the additive inverse of -5?

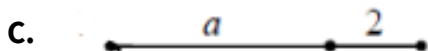
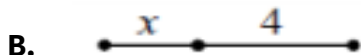
**Task/Question 2:**

**DOK Level 2:** Basic Application of Skills and Concepts

**Math Practice Standards:**

- MP 1: Make sense of problems and persevere in solving them.
- MP 4: Model with mathematics.
- MP 6: Attend to precision.

Write the expression that represents the total length of each segment:



**Task/Question 3:**

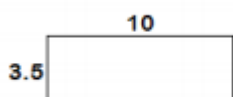
**DOK Level 2:** Basic Application of Skills and Concepts

**Math Practice Standards:**

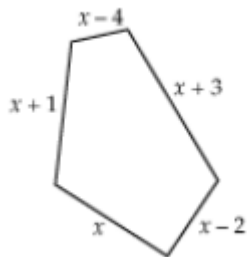
- MP 1: Make sense of problems and persevere in solving them.
- MP 6: Attend to precision.
- MP 4: Model with mathematics.

Write the expression that represents the Perimeter of each figure:

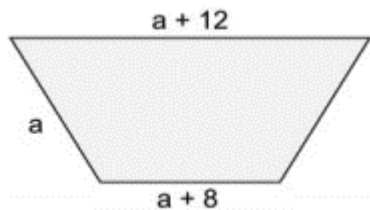
**A.**



**B.**



**C.**



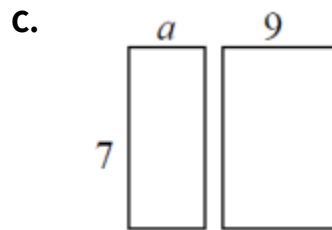
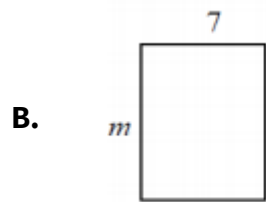
**Task/Question 4:**

**DOK Level 2:** Basic Application of Skills and Concepts

**Math Practice Standards:**

- MP 1: Make sense of problems and persevere in solving them.
- MP 4: Model with mathematics
- MP 6: Attend to precision.

Write the expression that represents the area of each figure:



**Task/Question 5:**

**DOK Level 3:** Strategic Thinking and Complex Reasoning

**Math Practice Standards:**

- MP 1: Make sense of problems and persevere in solving them.
- MP 3: Construct viable arguments and critique the reasoning of others.
- MP 4: Model with mathematics.
- MP 7: Look for and make use of structure.

**A.** Create a number sentence for the following:

***When 6 is added to four times a number ( $n$ ), the result is 50***

**B.** Find the solution for Part A.

**C.** Does Part A create an expression or an equation? Defend your answer.



## Task/Question 6:

**DOK Level 3:** Strategic Thinking and Complex Reasoning

### Math Practice Standards:

- MP 1: Make sense of problems and persevere in solving them.
- MP 3: Construct viable arguments and critique the reasoning of others.
- MP 4: Model with mathematics.
- MP 7: Look for and make use of structure.

**A.** Create an equation for the following scenario:

***Isaiah went to Krispy Kreme and bought one glazed lemon filled doughnut and two original glazed doughnuts. He ate them all for breakfast. How many total calories were in the doughnuts that Isaiah ate for breakfast?***

**B.** Use the internet to research the amount of calories for each doughnut in Part A. Substitute those values into your equation and solve:

**C.** Explain how Order of Operations was used as you solved your equation in Part B.

**D.** Create an equation for the following scenario:

***You and your friend are going to a movie next Sunday at 11:00 a.m. Your mom is asking you to take your three 6 year old cousins with you. How much will the tickets cost?***

- E.** Use the internet to research local movie theater ticket prices. Substitute the price of both student and child tickets to complete your equation in Part D and Solve:
- F.** Part A-E of this task are examples of how Algebra is used in the real-world. Describe another example of how you can use Algebra in the real-world. Be prepared to share and defend your example with your classmates.

## Complete Performance Task Scoring Rubric *Expressions and Equations*

20-27 Proficient 14-19 Good 9-13 Satisfactory 5-8 Poor 0-4 Unsatisfactory

	Depth of Knowledge Level	Points	Total Possible Points for Task	Total Points Earned by Student
<p><b>Task 1:</b></p> <p>A. A finite combination of symbols that is well-formed according to rules that depend on the context.</p> <p>B. A statement that the values of two mathematical expressions are equal (indicated by the sign =).</p> <p>C. 5</p>	<b>1</b>	<b>1</b>  <b>1</b>  <b>1</b>	<b>3</b>	
<p><b>Task 2:</b></p> <p>A. <math>x + 9</math></p> <p>B. <math>x + 4</math></p> <p>C. <math>a + 2</math></p>	<b>2</b>	<b>1</b>  <b>1</b>  <b>1</b>	<b>3</b>	
<p><b>Task 3:</b></p> <p>A. <math>2(10) + 2(3.5)</math></p> <p>B. <math>(x - 4) + (x + 3) + (x - 2) + x + (x + 1)</math></p> <p>C. <math>(a + 12) + a + a + (a + 8)</math></p>	<b>2</b>	<b>1</b>  <b>1</b>  <b>1</b>	<b>3</b>	
<p><b>Task 4:</b></p> <p>A. <math>5(4)</math></p> <p>B. <math>7m</math></p> <p>C. <math>7(a) + 7(9)</math></p>	<b>2</b>	<b>1</b>  <b>1</b>  <b>1</b>	<b>3</b>	

<p><b>Task 5:</b></p> <p>A. <math>6 + 4n = 50</math></p> <p>B. <math>n = 11</math></p> <p>C. Equation. The number sentence is able to be solved and includes an equal sign.</p>	<b>3</b>	<b>1</b> <b>1</b> <b>1</b>	<b>3</b>	
<p><b>Task 6:</b></p> <p>A. <math>L + 2g = C</math></p> <p>B. Lemon (290) Original Glazed (190); Total calories is 670</p> <p>C. Answers will vary. Student must multiply the glazed calories before adding the lemon calories.</p> <p>D. <math>2s + 3c = t</math></p> <p>E. Answers will vary. Answer should include two different prices because of student vs young child ticket prices.</p> <p>F. Answers will vary. Total points for a viable example.</p>	<b>3</b>	<b>2</b> <b>2</b> <b>2</b> <b>2</b> <b>2</b> <b>2</b>	<b>12</b>	
<b>TOTAL POINTS:</b>				



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