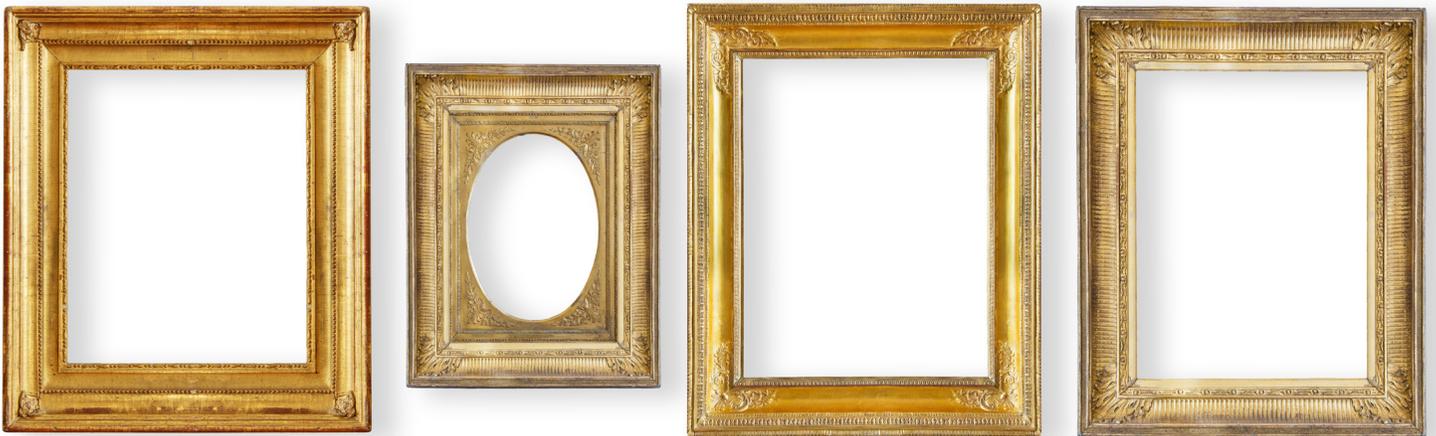


MeTEOR Performance Task

Algebra I

Mathematics

Expressions with a Picture Frame



Performance Task Item: Expressions with a Picture Frame

Grade Level: Algebra 1

Focus Area: Structure of Expressions

Essential Question: How do you evaluate and interpret algebraic expressions?

Core Ideas:

- Understands how to rewrite expressions in different equivalent forms.
- Understands how to rewrite algebraic expressions in different equivalent forms using factoring techniques.
- Understands how to simplify expressions.

Learning Targets:

- Students will interpret parts of an expression.
- Students will interpret complicated expressions by viewing one or more of their parts as a single entity.
- Students will use the structure of an expression to identify ways to rewrite it.
- Students will explain their reasoning.

STANDARDS

Domain: Algebra: Seeing Structure in Expressions

Content Standards:

- Interpret expressions that represent a quantity in terms of its context.
- Interpret parts of an expression, such as terms, factors and coefficients.
- Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret $P(1 + r)^2$ as the product of P and a factor not depending on P .*
- Use structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*

Supporting Standards:

- Know precise definitions of expression's terminology.
- Write expressions in equivalent forms to solve problems.

Math Practice Standards:

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

MP 2: Reason abstractly and quantitatively.

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. Write the definition of a **term**:

- B. Write the definition of a **coefficient**:

- C. Define a **constant term**:

Simplify each of the following expressions:

D. $5x + 3 - x =$ _____ $18 + 2(x + 2) =$ _____ $3(x + 6) - 2x =$ _____

- E. Write each of the following expressions using ***m*** as your variable.

Four times a number, reduced by two:

Subtract a number from the product of 3 and 7:

- F. Rick, an astronomer, charges \$125 for travel and \$50 for each hour he lectures the class on Pythagoras, a mathematician who put forward the idea that the universe is made of crystal spheres that encircle the Earth. According to him, the Sun, the Moon, the planets, and the stars travel in separate spheres.

Write an expression that shows Rick talked for 3 hours:

What is the total cost to have Rick speak for 3 hours?

Task/Question 2:

DOK Level 1: Recall & Reproduction

Math Practice Standards:

- MP 2: Reason abstractly and quantitatively.
- MP 6: Attend to precision.

A. Multiply each:

$$2(x + 7) = \underline{\hspace{2cm}}$$

$$(x + 4)(x + 2) = \underline{\hspace{2cm}}$$

$$3x(x - 3) = \underline{\hspace{2cm}}$$

$$xy(2xy + 4x - 7) = \underline{\hspace{2cm}}$$

$$(x + 9)^2 = \underline{\hspace{2cm}}$$

B. Factor each:

$$2x + 8 = \underline{\hspace{2cm}}$$

$$x^2 + 7x + 12 = \underline{\hspace{2cm}}$$

$$x^2 - 9 = \underline{\hspace{2cm}}$$

$$6x^2 + 13x - 28 = \underline{\hspace{2cm}}$$

$$3x^5 + 6x^4y - 45x^3y^2 = \underline{\hspace{2cm}}$$

C. What is the difference between a monomial, binomial and trinomial?

D. What happens to the middle term when you multiply two conjugate binomials together?

E. What operation is not used when referring to a polynomial?

Task/Question 3:

DOK Level 2: Basic Application of Skills & Concepts

Math Practice Standards:

- MP 1: Make sense of problems and persevere in solving them.
- MP 2: Reason abstractly and quantitatively.
- MP 4: Model with mathematics.
- MP 6: Attend to precision.

Rachel wanted to cut a board that is 50 inches long into three pieces. The second piece needs to be 5 inches longer than twice the length of the first piece. The third piece needs to be 5 inches longer than the first piece.

A. Set up the problem. Denote the first piece by x :

B. Solve the problem in Part A to find x :

C. Find the lengths of each of the three pieces using the value of x in Part B:

First length: _____ Second length: _____ Third length: _____

D. Explain how you can check to see if you answers are correct:

Complete Performance Task Scoring Rubric *Expressions with a Picture Frame*

22-24 Proficient 19-21 Good 17-18 Satisfactory 14-16 Poor 0-13 Unsatisfactory

	Depth of Knowledge Level	Points	Total Possible Points for Task	Total Points Earned by Student
<p>Task 1:</p> <p>A. A number, variable, product or quotient in an expression.</p> <p>B. A number that appears in front of a variable in an expression.</p> <p>C. A number value that cannot change.</p> <p>D. $4x + 3$, $2x + 22$, $x + 18$</p> <p>E. $4m - 2$, $3 \times 7 - m$</p> <p>F. $\\$50h + 125$, total $\\$275$</p>	1	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>	6	
<p>Task 2:</p> <p>A. $2x + 14$, $x^2 + 6x + 8$ $3x^2 - 9x$, $2x^2y^2 + 4x^2y - 7xy$ $x^2 + 18x + 81$</p> <p>B. $2(x + 4)$, $(x + 3)(x + 4)$ $(x + 3)(x - 3)$, $(2x + 7)(3x - 4)$ $3x^3(x - 3y)(x + 5y)$</p> <p>C. Amount of terms: Monomial has one term, Binomial has two terms, Trinomial has three terms</p> <p>D. Drops out/eliminates</p> <p>E. Division</p>	1	<p>2</p> <p>2</p> <p>1</p> <p>1</p> <p>1</p>	7	



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