MeTEOR Performance Task
Algebra I

Mathematics
Expressions with a Picture Frame

MeTEOR
CONNECTING THE DOTS

Performance Task Item: Expressions with a Picture Frame

Task/Question 1:

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:

A. Multiply each:

$2(x + 7) =$ _____ $(x + 4)(x + 2) =$ _____

$3x(x - 3) =$ _____ $xy(2xy + 4x - 7) =$ _____

$(x + 9)^2 =$ _____

B. Factor each:

$2x + 8 =$ _____ $x^2 + 7x + 12 =$ _____

$x^2 - 9 =$ _____ $6x^2 + 13x - 28 =$ _____

$3x^5 + 6x^4y - 45x^3y^2 =$ _____

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:

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:

Task/Question 4:

Faye has a rectangular frame that surrounds a 4 by 6 inch picture. The frame has a strip of uniform width, ***x*** inches, around the outside. The area of the strip is 24 square inches.

    A. Rewrite the definition of ***x***:

    B. What is the area of the inner rectangle?

    C. If the area of the strip is 24 square inches, what is the width of the strip in inches?

    D. How did you determine the value of ***x*** in Part C? Justify and defend how your approach to solving this is the **most efficient**.

    E. If Faye decided to purchase a frame to go around the edges of an 8 by 10 inch picture instead, what would the difference in area of the total frame be if the x value from ***Part A*** were to stay the same? Justify and defend your answer.