

<p>Task Model 1</p> <p>Response Type: Multiple Choice, single correct response</p> <p>DOK Level 1</p> <p>A-SSE.A.2 Use the structure of an expression to identify ways to rewrite it. <i>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 $(x^2 - y^2)(x^2 + y^2)$.</i></p> <p>Evidence Required: 1. The student uses the structure of an expression to identify ways of rewriting it.</p> <p>Tools: None</p>	<p>Prompt Features: The student is prompted to use the structure of an expression to select another expression that is equivalent to the given expression.</p> <p>Stimulus Guidelines:</p> <ul style="list-style-type: none"> • Expressions may be: <ul style="list-style-type: none"> ○ difference of two squares ○ sum/difference of two cubes ○ the product of two or three expressions ○ sum/difference of expressions that have a common factor ○ rational ○ exponential • Difficulty level can be altered by varying the type of expression and/or the order of factors in a compound expression, and by using different variables and coefficients. <p>TM1a Stimulus: The student is presented with an expression that is a difference of two squares.</p> <p>Example Stem: Select the expression that is equivalent to $x^2 - 4$.</p> <p style="margin-left: 20px;">A. $(x - 2)^2$ B. $(x - 2)(x + 2)$ C. $x^2 + 2x + 4$ D. $x^2 - 2x + 4$</p> <p>Rubric: (1 point) The student selects the correct option (e.g., B).</p> <p>Response Type: Multiple Choice, single correct response</p> <p>TM1b Stimulus: The student is presented with an expression that is the sum/difference of expressions that have a common factor.</p> <p>Example Stem: Select the expression that is equivalent to $(x + 4)^2 - (x - 2)(x + 4)$.</p> <p style="margin-left: 20px;">A. $4(x + 4)$ B. $2(x + 1)(x + 4)$ C. $(x + 4) - (x - 2)$ D. $(x + 4)[(x + 4) - (x - 2)]$</p> <p>Rubric: (1 point) The student selects the correct option (e.g., D).</p> <p>Response Type: Multiple Choice, single correct response</p>
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Task Model 1

Response Type:
Matching Tables

DOK Level 1

A-SSE.A.2

Use the 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 $(x^2 - y^2)(x^2 + y^2)$.*

Evidence Required:

1. The student uses the structure of an expression to identify ways of rewriting it.

Tools: None

TM1c

Stimulus: The student is presented with an expression that is a sum/difference of two cubes.

Example Stem 1: Determine whether each expression is equivalent to $(x^3 + 8)$. Select Yes or No for each expression.

	Yes	No
$(x + 2)^3$		
$(x - 2)(x^2 + 2x + 4)$		
$(x + 2)(x^2 - 2x + 4)$		

Example Stem 2: Determine whether each expression is equivalent to $(8x^3 - 64)$. Select Yes or No for each expression.

	Yes	No
$(2x - 4)^3$		
$8(x - 8)^3$		
$8(x - 2)(x^2 + 2x + 4)$		
$(2x - 4)(4x^2 + 8x + 16)$		

Rubric: (1 point) The student selects the correct options (e.g., NNY; NNYY).

Response Type: Matching Tables

HS Mathematics Item Specification C1 TD

Task Model 1

Response Type:
Matching Tables

DOK Level 2

A-SSE.A.2

Use the 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 $(x^2 - y^2)(x^2 + y^2)$.*

Evidence Required:

1. The student uses the structure of an expression to identify ways of rewriting it.

Tools: None

Prompt Features: The student is prompted to use the structure of expressions to determine if two expressions are equivalent.

Stimulus Guidelines:

- Equivalences consist of equations of expressions, which may involve:
 - difference of two squares
 - sum/difference of two cubes
 - the product of two or three expressions
 - sum/difference of expressions that have a common factor
 - rational expressions
 - exponential expressions
- Difficulty level can be altered by varying the type of expression and/or the order of factors in an equation, and by using different variables and coefficients.

TM1d

Stimulus: The student is presented with four equations.

Example Stem 1: Determine if each equation is true for all values of x . Select Yes or No for each equation.

	Yes	No
$x^2 + 4 = (x + 2)^2$		
$(2x + 6)^2 = 4(x + 3)^2$		
$(x - 3)(x - 3) = (x - 9)^2$		
$x^2 - 10x + 25 = (x - 5)(x + 5)$		

Example Stem 2: Determine if each equation is true for all values of x . Select Yes or No for each equation.

	Yes	No
$2^{3x} = 6^x$		
$100^x = 10^{2x}$		
$e^x \cdot e^x = e^{2x}$		
$2^{10x} = 10^{2x}$		

Rubric: (1 point) The student selects the correct options (e.g., NYNN; NYYN).

Response Type: Matching Tables

HS Mathematics Item Specification C1 TD

Task Model 1

Response Type: Drag and Drop

DOK Level 2

A-SSE.A.2

Use the 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 $(x^2 - y^2)(x^2 + y^2)$.*

Evidence Required:

1. The student uses the structure of an expression to identify ways of rewriting it.

Tools: None

Accessibility Note:

Drag and Drop items are not currently able to be Brailled. Minimize the number of items developed to this TM.

Prompt Features: The student is prompted to use the structure of a rational expression to create an expression that is equivalent to the given expression.

Stimulus Guidelines:

- Equivalences consist of equations of rational expressions.
- Difficulty level can be altered by varying the complexity of the equations, the type of rational expressions, and by using different variables and coefficients.

TM1e

Stimulus: The student is presented with two equivalent rational expressions with missing components that may be found using structure without carrying out the calculation.

Example Stem 1: Drag one or more expressions into each box to create an equation that is true for all values of x . (Assume no denominator equals zero.)

$$\frac{3}{x+2} + \frac{4}{x} = \frac{3\boxed{} + 4\boxed{}}{\boxed{}}$$

Preset Choices:

x x^2 $(x+2)$ $x(x+2)$ (x^2+2)

Example Stem 2: Drag one or more expressions into each box to create an equation that is true for all values of x . (Assume no denominator equals zero.)

$$\frac{3}{x+2} + \frac{4}{x} + \frac{2}{x^2} = \frac{3\boxed{} + 4\boxed{} + 2\boxed{}}{\boxed{}}$$

Preset Choices:

x x^2 $(x+2)$ $x(x+2)$ $x^2(x+2)$

Rubric: (1 point) The student drags the correct options.

Example Stem 1: x , $(x+2)$, $x(x+2)$;

Example Stem 2: x^2 , $x(x+2)$, $(x+2)$, $x^2(x+2)$

Response Type: Drag and Drop

Task Model 1
**Response Type:
Drag and Drop**
DOK Level 2
A-SSE.A.2

Use the 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 $(x^2 - y^2)(x^2 + y^2)$.*

Evidence Required:

1. The student uses the structure of an expression to identify ways of rewriting it.

Tools: None

Accessibility Note:

Drag and Drop items are not currently able to be Brailled.

Minimize the number of items developed to this TM.

Prompt Features: The student is prompted to use the structure of an expression to create an expression that is equivalent to the given expression.

Stimulus Guidelines:

- Equivalences consist of equations of expressions.
- Expressions may be:
 - difference of two squares
 - sum/difference of two cubes
 - the product of two or three expressions
 - sum/difference of expressions that have a common factor
 - rational
 - exponential
- Difficulty level can be altered by varying the type of expression and/or the order of factors in a compound expression, and by using different variables and coefficients.

TM1f

Stimulus: The student is presented with two equivalent expressions with missing numbers that may be found using structure without carrying out the calculation.

Example Stem 1: Drag a number into each box to create an equation that is true for all values of x .

$$2(4x + 3)(3x + 5) = \square x^2 + 58x + \square$$

Palette Choices: 6 8 12 15 24 29 30 58

Example Stem 2: Drag a number into each box to create an equation that is true for all values of x .

$$\frac{3(n + 2)(4n + 1)}{6} = \square n^2 + \frac{9}{2}n + \square$$

Palette Choices: $\frac{1}{6}$ $\frac{1}{3}$ $\frac{1}{2}$ 1 2 4 6 12

Example Stem 3: Drag a number into the box to create an equation that is true for all values of x .

$$(x + 2)^2 - 5 = x^2 + 4x + \square$$

Palette Choices: -4 -1 4 9

HS Mathematics Item Specification C1 TD

Task Model 1

Response Type:
Drag and Drop

DOK Level 2

A-SSE.A.2

Use the 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 $(x^2 - y^2)(x^2 + y^2)$.*

Evidence Required:

1. The student uses the structure of an expression to identify ways of rewriting it.

Tools: None

Accessibility Note:

Drag and Drop items are not currently able to be Brailled. Minimize the number of items developed to this TM.

Example Stem 4: Drag a number into the box to create an equation that is true for all values of x .

$$(x - 7)^2 + 51 = x^2 + \square x + 100$$

Palette Choices: -14 0 2 14 49

Example Stem 5: Drag a number into the box to create an equation that is true for all values of x .

$$\square(x - 10)(x + 12) = 3(x + 1)^2 - 363$$

Palette Choices: -12 -1 1 3 10

Rubric: (1 point) The student places the correct number in the box(es).

Example Stem 1: 24, 30;

Example Stem 2: 2, 1;

Example Stem 3: -1;

Example Stem 4: -14;

Example Stem 5: 3.

Response Type: Drag and Drop