Name: _____

Date: _____ Period: _____

Keystone Exam Review: Module 1

"Operations and Linear Equations & Inequalities"

Part 1: Multiple Choice Questions.

1)   An expression is shown below.

$$2\sqrt{51x}$$

Which value of *x* makes the expression equivalent to $10\sqrt{51}$?

A) 5   B) 25   C) 50   D) 100

2)   Simplify:

$$2(2\sqrt{4})^{-2}$$

A) $\dfrac{1}{8}$ B) $\dfrac{1}{4}$ C) 16   D) 32

3)   A polynomial expression is shown below.

$$(mx^3+3)(2x^2+5x+2)-(8x^5+20x^4)$$

The expression is simplified to $8x^3+6x^2+15x+6$. What is the value of *m*?

A) -8 B) -4 C) 4   D) 8

4)   Which is a factor of the trinomial $x^2-2x-15$?

A) $(x-13)$ B) $(x-5)$ C) $(x+5)$ D) $(x+13)$

5)   Simplify:

$$\frac{x^2-3x-10}{x^2+6x+8} \;\; ; \;\; x\neq-4\,,\,2$$

A) $-\dfrac{1}{2}x-\dfrac{5}{4}$ B) $x^2-\dfrac{1}{2}x-\dfrac{5}{4}$

C) $\dfrac{x-5}{x+4}$ D) $\dfrac{x+5}{x-4}$

1

6) Anna burned 15 calories per minute running for *x* minutes and 10 calories per minute hiking for *y* minutes. She spent a total of 60 minutes running and hiking and burned 700 calories. The system of equations shown below can be used to determine how much time Anna spent on each exercise.

$$15x + 10y = 700$$
$$x + y = 60$$

What is the value of *x* , the minutes Anna spent running?

      A) 10   B) 20   C) 30   D) 40

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7) Samantha and Maria purchased flowers. Samantha purchased 5 roses for *x* dollars each and 4 daisies for *y* dollars each and spent $32 on the flowers. Maria purchased 1 rose for *x* dollars and 6 daisies for *y* dollars each and spent $22. The system of equations shown below represents this situation.
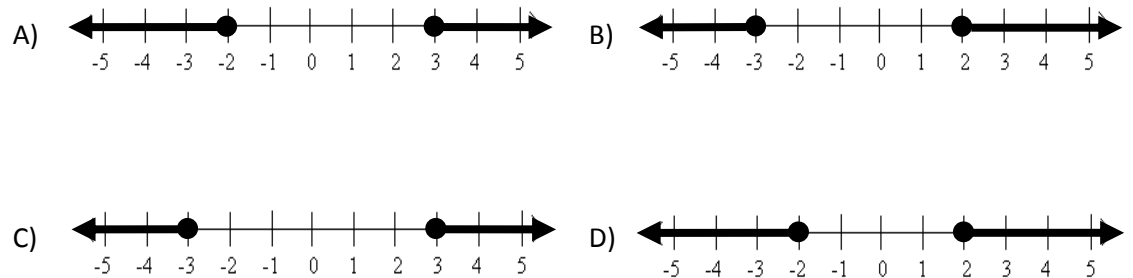
$$5x + 4y = 32$$
$$x + 6y = 22$$

Which statement is true?

    A) A rose costs $1 more than a daisy.

    B) Samantha spent $4 on each daisy.

    C) Samantha spent more on daisies than she did on roses.

    D) Maria spent 6 times as much on daisies as she did on roses.

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8) Which is the graph of the solution of the inequality $|2x - 1| \geq 5$?

A)

B)

C)

D)

9) A baseball team had $1000 to spend on supplies. The team spent $185 on a new bat. New baseballs cost $4 each. The inequality $185 + 4b \leq 1000$ can be used to determine the number of new baseballs (b) that the team can purchase. Which statement about the number of new baseballs that can be purchased is true?

   A) The team can purchase 204 new baseballs.

   B) The minimum number of new baseballs that can be purchased is 185.

   C) The maximum number of new baseballs that can be purchased is 185.

   D) The team can purchase 185 new baseballs, but this number is neither the maximum or minimum.

10) Matt always leaves a tip of between 8% and 20% for the server when he pays for his dinner. This can be represented by the system of inequalities shown below, where y is the amount of tip and x is the cost of dinner.

$$y > 0.08x$$
$$y < 0.2x$$

Which of the following is a true statement?

   A) When the cost of dinner, x, is $10 the amount of tip, y, must be between $2 and $8.

   B) When the cost of dinner, x, is $15 the amount of tip, y, must be between $1.20 and $3.00

   C) When the tip, y, is $3, the cost of dinner, x, must be between $11 and $23.

   D) When the tip, y is $2.40, the cost of dinner, x, must be between $3 and $6.

Nex

Part 2: Constructed-Response Questions.

11)   Kyle creates a painting on a rectangular canvas with a width that is four inches longer than the height, as shown in the diagram below.

h

$h + 4$
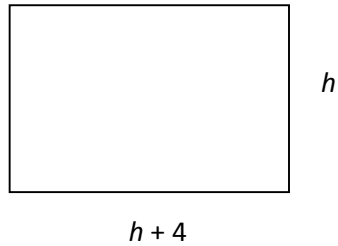
> **A)** Write a polynomial expression, in simplified form, that represents the area of the canvas.

Kyle adds a 3-inch-wide frame around all sides of his canvas.

> **B)** Write a polynomial expression, in simplified form, that represents the **total area** of the canvas and the frame.
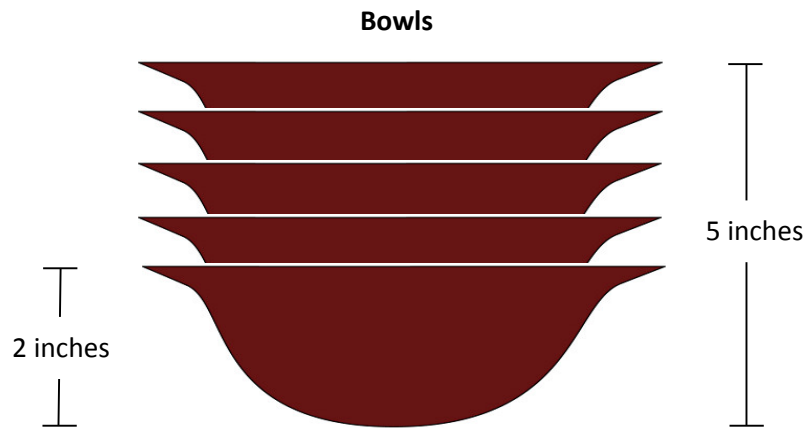
Go to the next page to finish question 11.

11)   *Continued*. Please refer to the previous page for task explanation.

Kyle is unhappy with his 3-inch-wide frame, so he decides to put a frame with a different width around his canvas. The total area of the canvas and the new frame is given by the polynomial $h^2 + 8h + 12$, where h represents the height of the canvas.

C)   Determine the width of the new frame. Show all your work. Explain why you did each step.

12) The diagram below shows 5 identical bowls stacked one inside the other.

Bowls

5 inches

2 inches

The height of 1 bowl is 2 inches. The height of a stack of bowls is 5 inches.

A) Write an equation using *x* and *y* to find the height of a stack of bowls based on any number of bowls.

equation: _____

B) Describe what the *x* and *y* variables represent.

x-variable: _____

y-variable: _____

Go to the next page to finish question 12.

12)   *Continued*. Please refer to the previous page for task explanation.

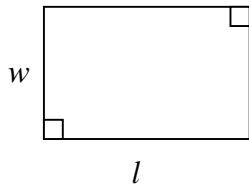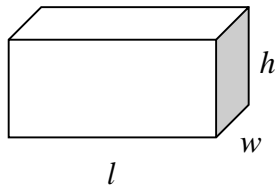**C)**   What is the height, in inches, of a stack of 10 bowls?

height: _____ inches

Formula Sheet

Formulas that you may need to work questions in this review are found below.

You may use calculator π or the number 3.14

Arithmetic Properties

$$A = l\,w$$

Additive Inverse: $\quad a + (-a) = 0$

Multiplicative Inverse: $\quad a \cdot \dfrac{1}{a} = 1$

Commutative Property: $\quad a + b = b + a$

$$a \cdot b = b \cdot a$$

Associative Property: $\quad (a+b)+c = a+(b+c)$

$$h \quad V = l\,w\,h$$

$$(a \cdot b) \cdot c = a \cdot (b \cdot c)$$

Identity Property: $\quad a + 0 = a$

$$a \cdot 1 = a$$

Linear Equations

Distributive Property: $\quad a \cdot (b+c) = ab + ac$

Slope: $\quad m = \dfrac{y_2 - y_1}{x_2 - x_1}$

Multiplicative Property of Zero: $\quad a \cdot 0 = 0$

Point-Slope Formula: $\quad (y - y_1) = m\,(x - x_1)$

Additive Property of Equality:

    If $a = b$, then $a + c = b + c$

Slope-Intercept Formula: $\quad y = mx + b$

Standard Equation of a Line: $\quad Ax + By = C$

Multiplicative Property of Equality:

    If $a = b$, then $a \cdot c = b \cdot c$