Integrated Math 1 - Chapter 4 Practice Work

Name _____ Core _____ Date _____

Lesson 4.1.1 – Finding Connections Between Representations

4-3. On graph paper, draw Figure 0 and Figure 4 for the pattern at right. Represent the number of tiles in each figure in an $x \rightarrow y$ table. Let x be the figure number and y be the total number of tiles.

   a. Use the table to graph the pattern.

   b. Without drawing Figure 5, predict where its point would lie on the graph. Justify your prediction.
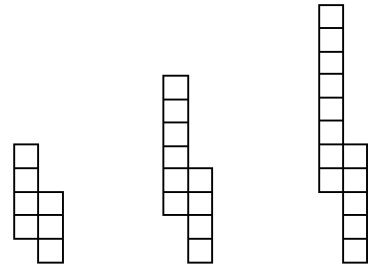

Figure 1   Figure 2   Figure 3

4-4. Evaluate the expressions below for the given values.

   a. $3(2x + 1)$ for $x = -8$

   b. $\frac{x-6}{4} - 1$ for $x = -14$

   c. $-2m^2 + 10$ for $m = -6$

   d. $k \cdot k \div k \cdot k \div k$ for $k = 9$

4-5. Copy and simplify the following expressions by combining like terms.

   e. $x + 3x - 3 + 2x^2 + 8 - 5x$

   f. $2x + 4y^2 - 6y^2 - 9 + 1 - x + 3x$

   g. $2x^2 + 30y - 3y^2 + 4xy - 14 - x$

   h. $20 + 3xy - 3xy + y^2 + 10 - y^2$

4-6. Use the Distributive Property to rewrite each expression.

   i. $3(2x - 7)$

   j. $-2(x - 7) + 5x$

   k. $5x + 10$

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✓ Lesson 4.1.2 – Seeing Growth in Different Expressions

4-17. Simplify each of the following equations and solve for x. Show all work and check your solutions.

    a. $7 - 3x = -x + 1$

    b. $-2 + 3x = -(x + 6)$

4-19. Copy and complete the table below.

IN (x)	2	10	6	7	−3		−10	1000	x
OUT (y)	9	25	17			15			

    a. Explain in words what is done to the input value (x) to produce the output value (y).

    b. Write the rule you described in part (a) with algebraic symbols.

4-20. When Susan's brother went to college, she and her two sisters evenly divided his belongings. Among his possessions were 3 posters, 216 books, and 24 CDs. How were these items divided?

✓ Lesson 4.1.3 – Connecting Linear Rules and Graphs

4-25. Two of the connections in your Representations of Patterns Web are pattern → table and pattern → rule. Practice these connections as you answer the questions below.
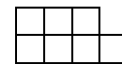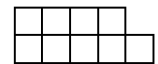
Figure 1   Figure 2   Figure 3

    a. On graph paper, draw Figure 0 and Figure 4 for the pattern at right.

    b. Represent the number of tiles in each figure with a table.

    c. Represent the number of tiles in each figure with an algebraic rule.

4-27. For each of the equations below, solve for x. Show all work and check your solution.

    a. $-2 + 2x = -x + 2 + x$

    b. $2 - 3x = x + 2$

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4-29. Joe drove 100 miles from San Francisco to Gilroy and used 4 gallons of gas. How much gas should he expect to use for a 3000-mile trip to New York City? What is the unit rate (miles per gallon)? Be sure to justify your reasoning.

✓ Lesson 4.1.4 – y=mx+b

4-37. Examine the $x \rightarrow y$ table at right.

a. Invent a tile pattern that fits this data.

b. How is the pattern growing? Show where the pattern of growth appears in the $x \rightarrow y$ table and the tile pattern.

c. Write a rule for this pattern.

Figure Number	Number of Tiles
0	5
1	9
2	13
3	17

4-38. Look at the graph at right. What statements can you make about the tile pattern the graph represents? How many tiles are in Figure 0? Figure 1? What is the pattern of growth? What is the rule for the pattern?
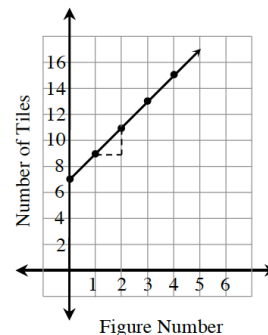
4-39. For each equation below, solve for x. Check your solution, if possible, and show all work.

$$3x - 6 + 1 = -2x - 5 + 5x \qquad\qquad -2x - 5 = 2 - 4x - (x - 1)$$

4-40. I am thinking of a number. When I double my number and then subtract the result from five, I get negative one. What is my number? Write and solve an equation.

4-41. On your paper, copy the table below and use your pattern skills to complete it.

IN (x)	2	10				–3			x
OUT (y)	4	28	13	–17	10		2.5	148	$3x - 2$

- Explain in words what is done to the input value, x, to produce the output value, y.

- Explain the process you used to find the missing input values.

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Lesson 4.1.5 – Checking the Connections

4-44. Complete a table for the rule $y = 3x - 2$ and graph.

4-48. Simplify each of the expressions below. You may use an Equation Mat and tiles.

    a. $-(5x + 1)$

    b. $6x - (-5x + 1)$

    c. $-(1 - 5x)$

    d. $-5x + (x - 1)$

4-49. Invent a tile pattern that grows by 4 each time. Draw Figures 0, 1, 2, and 3. Use color or shading to show the growth.

Lesson 4.1.6 – Graphing a Line Without an x -> y table

4-59. Use what you know about m and b to graph each rule below without making a table. Draw a growth triangle for each line.

    a. $y = -2x + 5$

    b. $y = 3x$

    c. $y = \frac{1}{2}x + 1$

    d. $y = 2x - 3$

4-60. Examine the graph at right, which displays three tile patterns.

    e. What do you know about Figure 0 for each of the three patterns?

    f. Which pattern changes most quickly? How quickly does it change? Show how you know.

    g. Which figure number has the same number of tiles in patterns B and C? Explain how you know.
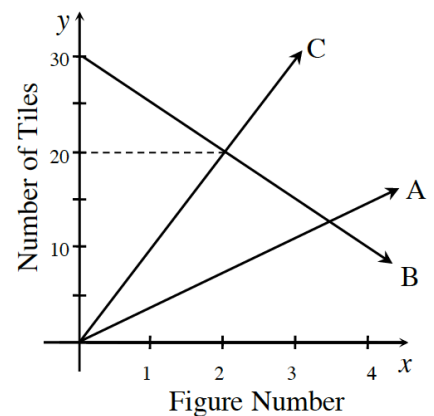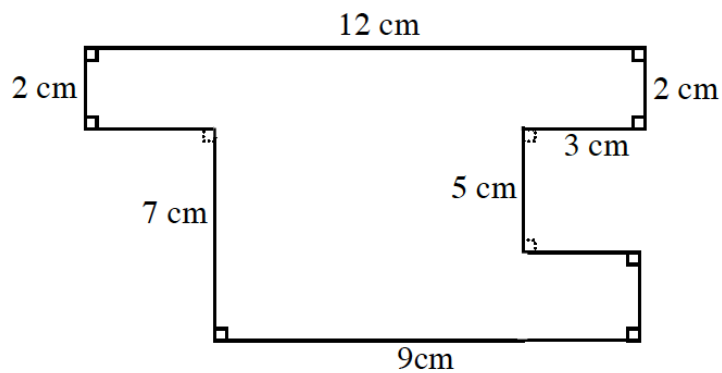
4-61. Translate these algebraic statements into words: $y = 2x + 5$ and $y = 6x + 5$.

    h. What do you know about Figure 0 for each pattern?

    i.   Which pattern grows most quickly? How do you know?

4-62. Find the area and perimeter of each shape. Show your work.

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✓ Lesson 4.1.7 – Completing the Web

4-67. Use what you know about *m* and *b* to graph each equation below without making a table. Show a growth triangle on each graph and label the *x*- and *y*-intercepts.

   a. $y = 3 - 2x$

   b. $y = 2x$

   c. $y = 3$

   d. $y = -\frac{1}{2}x + 3$

4-69. For a tile pattern with the rule $y = 6x + 4$ (where x represents the figure number and y represents the number of tiles), which figure number has 40 tiles in it? How do you know?

4-70. Josie and Jules are building a model car. They find that the real car is 54 inches tall and 180 inches long. They decide to make their model 3 inches tall, but now they are having a disagreement. Josie thinks that their model should be 10 inches long and Jules thinks it should be 129 inches long. Help them settle their argument by deciding if either of them is correct. Explain how you know exactly how long their model should be.