Name _____ Date _____

Master 10.11

Step-by-Step 1

Lesson 1, Question 8

You will need 0.5-cm grid paper.

Step 1 On grid paper, outline a 33 by 30 array.

Step 2 Draw a horizontal or a vertical line to break the array into 2 parts.

Step 3 How did you decide where to draw the line?

_____

Step 4 Write a multiplication sentence for each of the 2 smaller arrays.

_____

Are these products easy to find? Explain.

_____

If not, draw a different line in *Step 2*, and break the array into 2 different parts. Repeat *Steps 3* and *4*.

_____

_____

Step 5 Find the product for each of the 2 smaller arrays you created.

_____

Step 6 Find the sum of the products in *Step 5*: _____

What is the area of the gym floor?

_____

Name _____ Date _____

Master 10.12

Step-by-Step 2

Lesson 2, Question 5

Step 1 Complete the table.

Fraction	Decimal
$\frac{1}{9}$	
$\frac{2}{9}$	
$\frac{3}{9}$	

Step 2 Look at the Fraction column. What patterns do you see?

_____

Step 3 Look at the Decimal column. What patterns do you see?

_____

Step 4 Use the pattern you found in *Step 3*.
Do not use a calculator.
Predict the decimal equivalent of each fraction.
Complete the table.

Fraction	Decimal Prediction
$\frac{4}{9}$	
$\frac{5}{9}$	
$\frac{6}{9}$	
$\frac{7}{9}$	
$\frac{8}{9}$	

Step 5 How did you make your predictions?

_____

_____

Step 6 What is the decimal for $\frac{9}{9}$? Explain.

_____

_____

Name _____ Date _____

Master 10.13

Step-by-Step 3

Lesson 3, Question 6

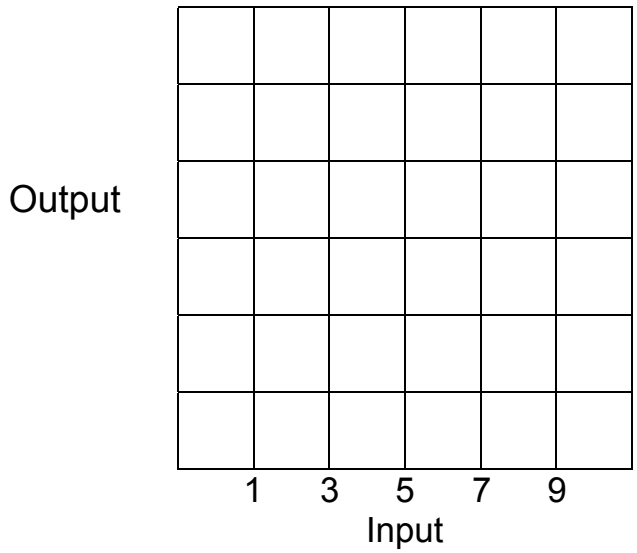
Step 1 Place an operation ($\times$, $\div$, +, –) and a number in the box.

Input ⟶ [ ] ⟶ Output

Step 2 Complete the table.
Use the operation and the number from *Step 1* to find the Output.

Input	Output
1	
3	
5	
7	
9	

Step 3 Graph the Input/Output numbers.
Create your own intervals for the Output axis.



Step 4 Look at your graph. Describe it.

_____

_____

Name _____ Date _____

Master 10.14

Step-by-Step 4

Lesson 4, Question 6

Step 1 The length of a domino is 2 units. Its width is 1 unit.
With dominoes, make a rectangle with 1 side 2 units long.

How many different rectangles can you make with 1 domino? _____

How many different rectangles can you make with 2 dominoes? _____

How many different rectangles can you make with 3 dominoes? _____

How many different rectangles can you make with 4 dominoes? _____

Step 2 Predict the number of different rectangles you could make with 6 dominoes. _____

Step 3 How can you check that your prediction is right?

_____

_____

Step 4 What are the first 6 Fibonacci numbers?

_____

Step 5 How do the numbers of rectangles you found relate to the Fibonacci numbers?

_____

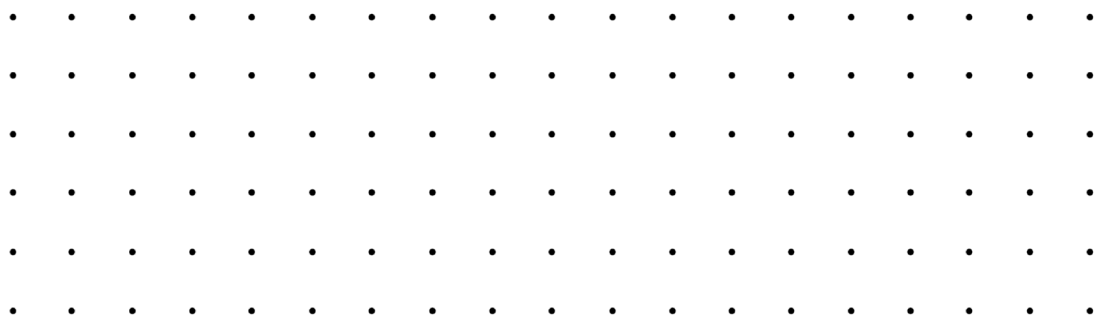
Name _____ Date _____

Master 10.15

Step-by-Step 6

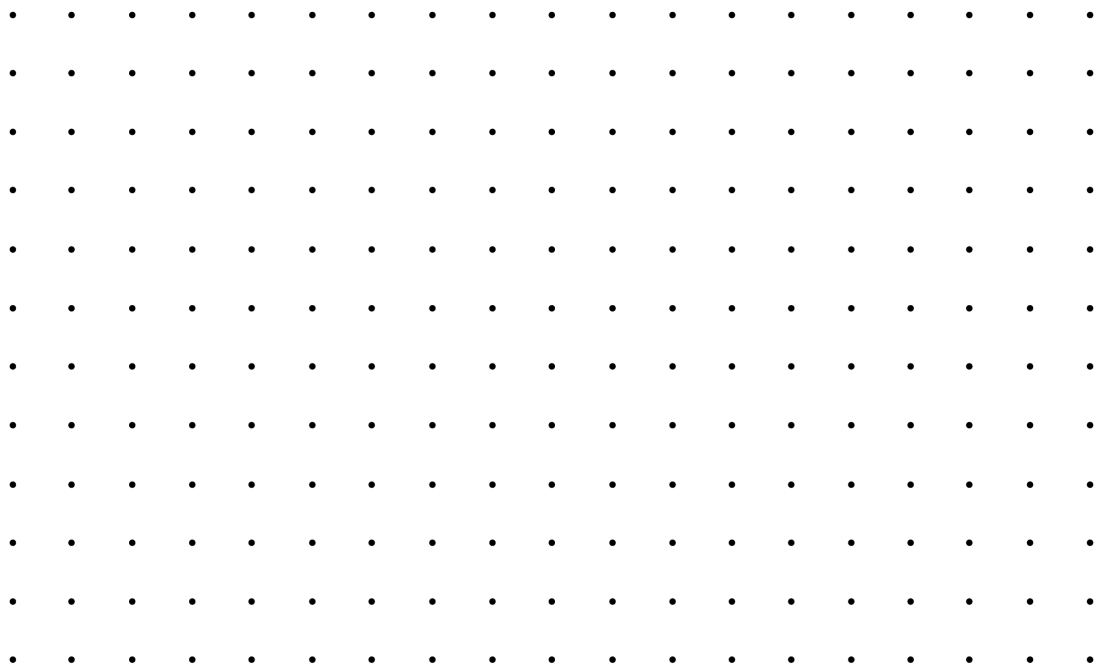
Lesson 6, Question 3

Step 1 Draw 2 different figures on square dot paper.



Step 2 Can these figures be put together without any gaps or overlaps? _____
If they can, then go to the next step.
If not, change one or more of the figures.

Step 3 Use your figures to make a tiling pattern.



Step 4 Describe your pattern.

_____

_____

_____

_____

Name _____ Date _____

Master 10.16a

Unit Test: Unit 10 Patterns in Number and Geometry

Part A

1. Multiply. Use mental math.

a) $2 \times 13 \times 5 =$ _____ **b)** $27 \times 5 \times 2 =$ _____ **c)** $2 \times 186 \times 5 =$ _____

d) $2 \times 43 \times 10 =$ _____ **e)** $3 \times 13 \times 10 =$ _____ **f)** $4 \times 50 \times 2 =$ _____

2. Multiply.
$13 \times 30 =$ _____

Use this multiplication fact to find the missing factors.

a) $\square \times 30 = 360$ **b)** $\square \times 30 = 420$

c) $330 = \square \times 30$ **d)** $450 = \square \times 30$

3. **a)** Change each fraction to a decimal.

Fraction	Decimal
$\frac{1}{13}$	
$\frac{2}{13}$	
$\frac{3}{13}$	
$\frac{4}{13}$	
$\frac{5}{13}$	
$\frac{6}{13}$	

b) Describe any patterns.

_____

_____

Name _____ Date _____

Master 10.16b

Unit Test continued

Part B

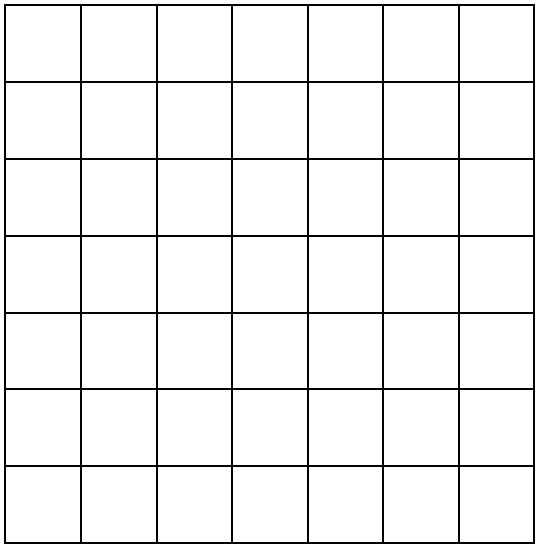
4. Evan is paid $8 per hour to mow lawns.
The table shows his earnings.

Hours	Amount Earned ($)
1	8
3	24
5	40
7	56

a) Write a pattern rule for the amount earned.

_____

b) Draw a line graph to display the data.



c) Suppose Evan works 6 h.
Use the graph to find how much he will earn.

_____

Name _____ Date _____

Master 10.16c

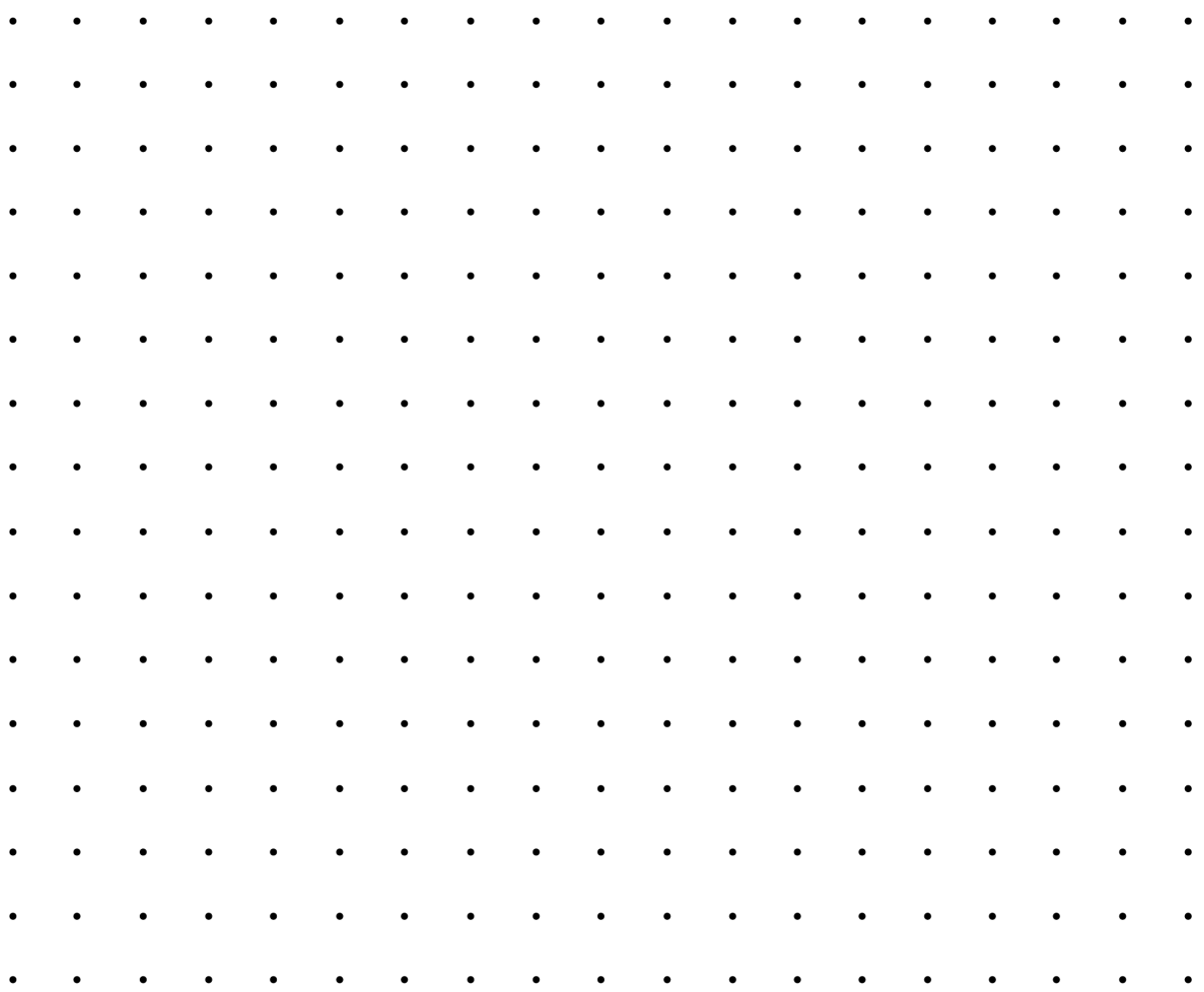
Unit Test continued

5. Suppose you followed the Fibonacci pattern, but started at 7.
7, 7, 14, …
Show the first 10 numbers in this pattern.

_____

Part C

6. **a)** Create a tiling pattern using more than two different figures.



b) Describe your pattern.

_____

_____

Name _____ Date _____

Master 10.17

Sample Answers

Unit Test – Master 10.16

Part A

1. a) 130 **b)** 270 **c)** 1860
d) 860 **e)** 390 **f)** 400

2. 390
a) 12 **b)** 14
c) 11 **d)** 15

3. a)

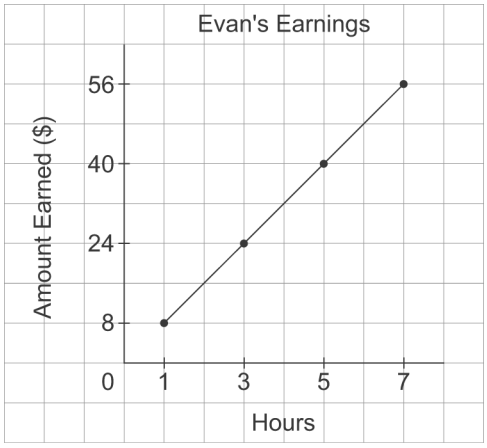
Fraction	Decimal
$\frac{1}{13}$	0.076 923 …
$\frac{2}{13}$	0.153 846 1…
$\frac{3}{13}$	0.230 769 2…
$\frac{4}{13}$	0.307 692 3…
$\frac{5}{13}$	0.384 615 3…
$\frac{6}{13}$	0.461 538 4…

b) 6 decimals are repeating decimals. The repeating decimals for fractions with numerators 1, 3, and 4 have 076923 in their core, but in a different order. The repeating decimals for fractions with numerators 2, 5, and 6 have 153846 in their core, but in a different order.

Part B

4. a) Multiply the number of hours worked by $8.

b)

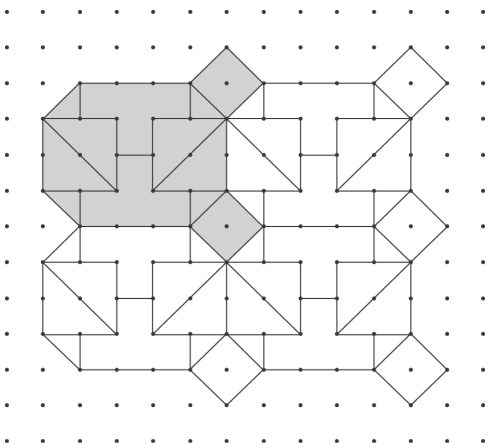


c) $48

5. 7, 7, 14, 21, 35, 56, 91, 147, 238, 385

Part C

6. a)
Sample answer:



b) My tiling pattern uses 2 T-shaped figures, 2 kinds of isosceles right triangles (4 of each), and 2 squares.

Extra Practice Masters 10.18–10.21

Go to the CD-ROM to access editable versions of these Extra Practice Masters.

Name _____ Date _____

Master 10.18

Extra Practice 1

Lesson 1: Patterns in Multiplication

1. Multiply. Use mental math.
   a) $2 \times 17 \times 5$ b) $31 \times 5 \times 2$ c) $2 \times 147 \times 5$
   d) $2 \times 43 \times 50$ e) $3 \times 18 \times 10$ f) $4 \times 50 \times 5$
2. Multiply 10×35. Use this multiplication fact to find the missing factors.
   a) $\square \times 35 = 385$ b) $\square \times 35 = 315$
   c) $420 = \square \times 35$ d) $280 = \square \times 35$

Lesson 2: Exploring Patterns in Decimals with a Calculator

1. a) Change each fraction to a decimal.
   $\frac{1}{12}, \frac{2}{12}, \frac{3}{12}, \frac{4}{12}, \frac{5}{12}, \frac{6}{12}, \frac{7}{12}$
   b) Describe any patterns.
   c) Write five other fractions with denominator 12. Change these fractions to decimals.
2. a) Copy and complete each table for numerators to 10.

Fraction	Decimal
$\frac{1}{5}$	
$\frac{2}{5}$	
$\frac{3}{5}$	

Fraction	Decimal
$\frac{1}{10}$	
$\frac{2}{10}$	
$\frac{3}{10}$	

   b) Describe the pattern in each table.
   c) How are the patterns in the tables the same? How are they different?

Name _____ Date _____

Master 10.19

Extra Practice 2

Lesson 3: Graphing Patterns

1. Wayne is paid $7 an hour to mow lawns. The table shows his earnings.

Hours	Amount Earned ($)
2	14
4	28
6	42
8	56

   a) Write a pattern rule for the amount earned.
   b) Draw a line graph to display the data.
   c) Suppose Wayne works 7 h. Use the graph to find how much he will earn.

Lesson 4: Another Number Pattern

1. a) Find the 15th Fibonacci number.
   b) What is the sum of the first 15 Fibonacci numbers?
2. Suppose you followed the Fibonacci pattern, but started at 6.
   6, 6, 12, ...
   Show the first 10 numbers in this pattern.

Name _____ Date _____

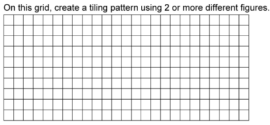
Master 10.20

Extra Practice 3

Lesson 6: Tiling Patterns

1. For the pattern below, describe:
   - the figures used in the pattern
   - the part of the pattern that repeats
   - how you could extend the pattern

2. a) On this grid, create a tiling pattern using 2 or more different figures.



   b) Describe your pattern.

Name _____ Date _____

Master 10.21

Sample Answers

Extra Practice 1 – Master 10.18

Lesson 1

1. a) 170 **b)** 310 **c)** 1470
d) 4300 **e)** 540 **f)** 1000
2. a) 11 **b)** 9
c) 12 **d)** 8

Lesson 2

1. a) 0.083 333 3..., 0.166 666 6..., 0.25, 0.333 333 3..., 0.416 666 6..., 0.5, 0.583 333 3...
b) Start at 0.083 333 3... and keep adding 0.083 333 3 to get the next decimal.
c) $\frac{8}{12}, \frac{9}{12}, \frac{10}{12}, \frac{11}{12}, \frac{12}{12}$
0.666 666 6..., 0.75, 0.833 333 3..., 0.916 666 6..., 1

2. a)

Fraction	Decimal
$\frac{1}{5}$	0.2
$\frac{2}{5}$	0.4
$\frac{3}{5}$	0.6
$\frac{4}{5}$	0.8
$\frac{5}{5}$	1
$\frac{6}{5}$	1.2
$\frac{7}{5}$	1.4
$\frac{8}{5}$	1.6
$\frac{9}{5}$	1.8
$\frac{10}{5}$	2

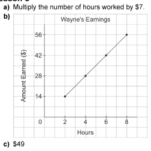
Fraction	Decimal
$\frac{1}{10}$	0.1
$\frac{2}{10}$	0.2
$\frac{3}{10}$	0.3
$\frac{4}{10}$	0.4
$\frac{5}{10}$	0.5
$\frac{6}{10}$	0.6
$\frac{7}{10}$	0.7
$\frac{8}{10}$	0.8
$\frac{9}{10}$	0.9
$\frac{10}{10}$	1

b) In the first table, each fraction has 5 in the denominator. The pattern rule for the numerator is: Start at 1. Add 1 each time. The decimals start at 0.2 and increase by 0.2 each time. In the second table, each fraction has 10 in the denominator. The pattern rule for the numerator is: Start at 1. Add 1 each time. The decimals start at 0.1 and increase by 0.1 each time.
c) The pattern rule for the numerator of each fraction is the same: Start at 1. Add 1 each time. The fractions are different because they have different denominators. The denominator in the second table is 2 times the denominator in the first table. The decimals in the first table start at 0.2 and increase by 0.2 each time. The decimals in the second table start at 0.1 and increase by 0.1 each time. The decimals in both tables are terminating decimals.

Extra Practice 2 – Master 10.19

Lesson 3

1. a) Multiply the number of hours worked by $7.
b)



c) $49

Lesson 4

1. a) 610
b) 1596
2. 6, 6, 12, 18, 30, 48, 78, 126, 204, 330

Extra Practice 3 – Master 10.20

Lesson 6

1. The figures used are hexagons and rhombuses. The part of the pattern that repeats has 2 hexagons and a rhombus. I would add 2 hexagons and a rhombus on either end to extend my pattern.
2. a) A tiling pattern using 2 or more figures should be drawn on the grid. There should be no gaps or overlaps.
b) A description of the tiling pattern, such as: The core of my pattern is a rhombus and two trapezoids. I can extend the pattern by adding another rhombus and 2 trapezoids, and so on, until my tiling pattern covers the grid.

Addison Wesley Mathematics Makes Sense

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