Table of Contents

Table of Contents.....1

Letter to Students and Teachers.....3

Table of Contents with Standards for Grade 4.....5

Number Sense and Operations.....11

Whole Number Place Value.....12
Read and Write Numbers to 1,000,000.....17
Order and Compare Whole Numbers.....22
Round Whole Numbers.....28
Order and Compare Decimals.....34
Automaticity with Multiplication and Division Facts.....40
Procedural Reliability with Multiplication.....48
Procedural Fluency with Multiplication.....55
Procedural Reliability with Division.....63
Estimation with Multiplication and Division.....71
Identify a number one-tenth and one-hundredth, more or less.....77
Addition and Subtraction with Decimals.....82

Fractions.....90

Decimal Fractions and related Mixed Numbers.....91
Use Decimal Notation to Represent Fractions.....99
Generate Equivalent Fractions.....105
Order and Compare Fractions and Mixed Numbers.....112
Decompose Fractions and Mixed Numbers.....120
Add and Subtract Fractions with Like Denominators.....127
Explore Addition with Equivalent Decimal Fractions.....134
Explore Multiplication of Fractions with Whole Numbers.....141

Algebraic Reasoning.....147

Solve Real-World Problems with Multiplication and Division.....148

Solve Real-World Fraction Problems with Addition and Subtraction...153

Solve Real-World Problems involving Multiplication of Fractions with Whole Numbers.....159

Determine if a Whole Number Equation is True or False.....164

Write an Equation to Determine an Unknown.....168

Determine Factor Pairs and Identify Prime and Composite Numbers..172

Generate, Describe and Extend a Numerical Pattern.....178

Measurement.....184

Select Appropriate Tools to Measure an Object.....185

Convert within a Single System of Measurement.....193

Solve Two-Step Distance and Time Problems.....197

Solve Real-World Money Problems Using Decimal Notation.....202

Geometric Reasoning.....207

Explore and Classify Angles of Two-Dimensional Figures.....208

Estimate, Measure and Draw Angles.....217

Solve Problems with Unknown Angle Measures.....228

Solve Area and Perimeter Problems for Rectangles.....234

Solve Problems with Same/Different Areas and Perimeters.....242

Data Analysis and Probability.....251

Collect and Represent Numerical Data.....252

Determine the Mode, Median and Range to Interpret Data.....262

Solve Real-World Problems Involving Data.....268

Glossary.....274

Item Type Reference Sheet.....281

Table of Contents with Standards

Number Sense and Operations 11

Understand place value for multi-digit numbers.

MA.4.NSO.1.1 12

Express how the value of a digit in a multi-digit whole number changes if the digit moves one place to the left or right.

MA.4.NSO.1.2 17

Read and write multi-digit whole numbers from 0 to 1,000,000 using standard form, expanded form and word form.

MA.4.NSO.1.3 22

Plot, order and compare multi-digit whole numbers up to 1,000,000.

MA.4.NSO.1.4 28

Round whole numbers from 0 to 10,000 to the nearest 10, 100 or 1000.

MA.4.NSO.1.5 34

Plot, order and compare decimals up to the hundredths.

Build an understanding of operations with multi-digit numbers including decimals.

MA.4.NSO.2.1 40

Recall multiplication facts with factors up to 12 and related division facts with automaticity.

MA.4.NSO.2.2 48

Multiply two whole numbers, up to three digits by up to two digits, with procedural reliability.

MA.4.NSO.2.3 55

Multiply two whole numbers, each up to two digits, including using a standard algorithm with procedural fluency.

MA.4.NSO.2.4 63

Divide a whole number up to four digits by a one-digit whole number with procedural reliability. Represent remainders as fractional parts of the divisor.

MA.4.NSO.2.5 ……71

Explore the multiplication and division of multi-digit whole numbers using estimation, rounding and place value.

MA.4.NSO.2.6.……77

Identify the number that is one-tenth more, one-tenth less, one hundredth more and one-hundredth less than a given number.

MA.4.NSO.2.7.……82

Explore the addition and subtraction of multi-digit numbers with decimals to the hundredths.

Fractions……90

Develop an understanding of the relationship between different fractions and the relationship between fractions and decimals.

MA.4.FR.1.1……91

Model and express a fraction, including mixed numbers and fractions greater than one, with the denominator 10 as an equivalent fraction with the denominator 100.

MA.4.FR.1.2……99

Use decimal notation to represent fractions with denominators of 10 or 100, including mixed numbers and fractions greater than 1, and use fractional notation with denominators of 10 or 100 to represent decimals.

MA.4.FR.1.3……105

Identify and generate equivalent fractions, including fractions greater than one. Describe how the numerator and denominator are affected when the equivalent fraction is created.

MA.4.FR.1.4……112

Plot, order and compare fractions, including mixed numbers and fractions greater than one, with different numerators and different denominators.

Build a foundation of addition, subtraction and multiplication operations with fractions.

MA.4.FR.2.1……120

Decompose a fraction, including mixed numbers and fractions greater than one, into a sum of fractions with the same denominator in multiple ways. Demonstrate each decomposition with objects, drawings and equations.

MA.4.FR.2.2……127

Add and subtract fractions with like denominators, including mixed numbers and fractions greater than one, with procedural reliability.

MA.4.FR.2.3……134

Explore the addition of a fraction with denominator of 10 to a fraction with denominator of 100 using equivalent fractions.

MA.4.FR.2.4……141

Extend previous understanding of multiplication to explore the multiplication of a fraction by a whole number or a whole number by a fraction.

Algebraic Reasoning……147

Represent and solve problems involving the four operations with whole numbers and fractions.

MA.4.AR.1.1 …… 148

Solve real-world problems involving multiplication and division of whole numbers including problems in which remainders must be interpreted within the context.

MA.4.AR.1.2……153

Solve real-world problems involving addition and subtraction of fractions with like denominators, including mixed numbers and fractions greater than one.

MA.4.AR.1.3……159

Solve real-world problems involving multiplication of a fraction by a whole number or a whole number by a fraction.

Demonstrate an understanding of equality and operations with whole numbers.

MA.4.AR.2.1……164

Determine and explain whether an equation involving any of the four operations with whole numbers is true or false.

MA.4.AR.2.2……168

Given a mathematical or real-world context, write an equation involving multiplication or division to determine the unknown whole number with the unknown in any position.
.

Recognize numerical patterns, including patterns that follow a given rule.

MA.4.AR.3.1……172

Determine factor pairs for a whole number from 0 to 144. Determine whether a whole number from 0 to 144 is prime, composite or neither.

MA.4.AR.3.2……178

Generate, describe and extend a numerical pattern that follows a given rule.

Measurement……184

Measure the length of objects and solve problems involving measurement.

MA.4.M.1.1……185

Select and use appropriate tools to measure attributes of objects.

MA.4. M.1.2……193

Convert within a single system of measurement using the units: yards, feet, inches; kilometers, meters, centimeters, millimeters; pounds, ounces; kilograms, grams; gallons, quarts, pints, cups; liter, milliliter; and hours, minutes, seconds.

Solve problems involving time and money.

MA.4.M.2.1……197

Solve two-step real-world problems involving distances and intervals of time using any combination of the four operations.

MA.4.M.2.2 ……202

Solve one- and two-step addition and subtraction real-world problems involving money using decimal notation.

Geometric Reasoning ……207

Draw, classify and measure angles.

MA.4.GR.1.1……208

Informally explore angles as an attribute of two-dimensional figures. Identify and classify angles as acute, right, obtuse, straight or reflex.

MA.4.GR.1.2……217

Estimate angle measures. Using a protractor, measure angles in whole-number degrees and draw angles of specified measure in whole-number degrees. Demonstrate that angle measure is additive.

MA.4.GR.1.3……228

Solve real-world and mathematical problems involving unknown whole number angle measures. Write an equation to represent the unknown.

Solve problems involving the perimeter and area of rectangles.

MA.4.GR.2.1……234

Solve perimeter and area mathematical and real-world problems, including problems with unknown sides, for rectangles with whole-number side lengths.

MA.4.GR.2.2……242

Solve problems involving rectangles with the same perimeter and different areas or with the same area and different perimeters

Data Analysis and Probability……251

Collect, represent and interpret data and find the mode, median and range of a data set.

MA.4.DP.1.1……252

Collect and represent numerical data, including fractional values, using tables, stem-and-leaf plots or line plots.

MA.4.DP.1.2……262

Determine the mode, median or range to interpret numerical data including fractional values, represented with tables, stem-and-leaf plots or line plots.

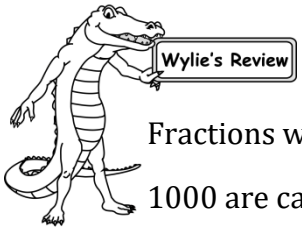
MA.4.DP.1.3……268

Solve real-world problems involving numerical data.

Decimal Fractions and related Mixed Numbers

Develop an understanding of the relationship between different fractions and the relationship between fractions and decimals.

Model and express a fraction including mixed numbers and fractions greater than one, with the denominator 10 as an equivalent fraction with the denominator 100.



Fractions with denominators of 10, 100, or other multiples of ten such as 1000 are called **decimal fractions.** $\frac{2}{10}$, $\frac{8}{10}$, $\frac{30}{100}$, and $\frac{70}{100}$ are some examples of decimal fractions.

Wylie uses money to help him understand decimal fractions. He remembers that a fraction represents part of a whole. When thinking of decimal fractions, use the dollar to represent one whole.

10 dimes = 1 whole dollar

1 dime = $\frac{1}{10}$ of a dollar

2 dimes = $\frac{2}{10}$ of a dollar

3 dimes = $\frac{3}{10}$ of a dollar

100 pennies = 1 whole dollar

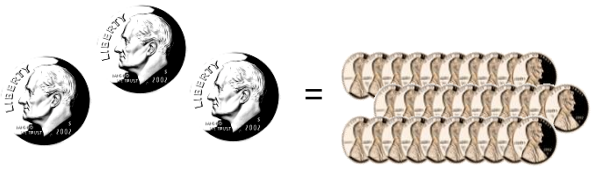
1 penny = $\frac{1}{100}$ of a dollar

2 pennies = $\frac{2}{100}$ of a dollar

3 pennies = $\frac{3}{100}$ of a dollar

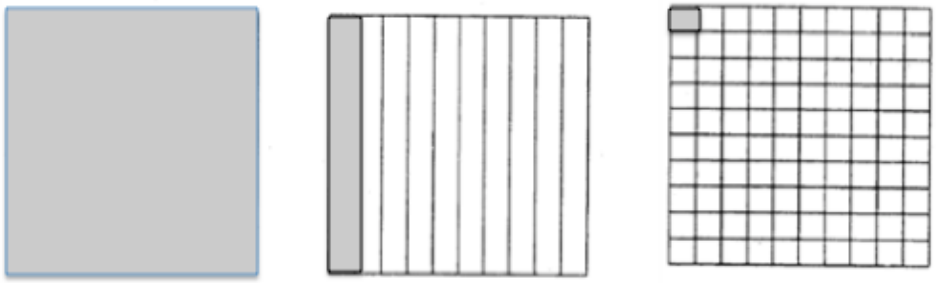
Equivalencies with Money:

$$\frac{1}{10} = \frac{10}{100}$$



$$\frac{3}{10} = \frac{30}{100}$$

Grids are also very good models to use for decimal fractions.

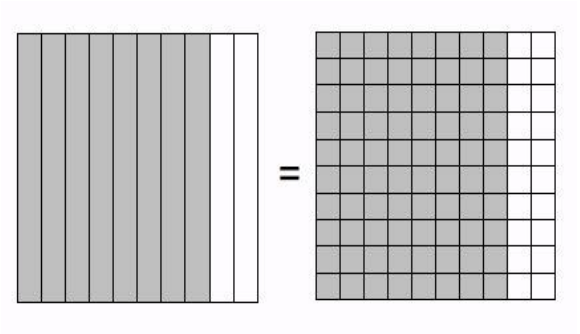


1 whole

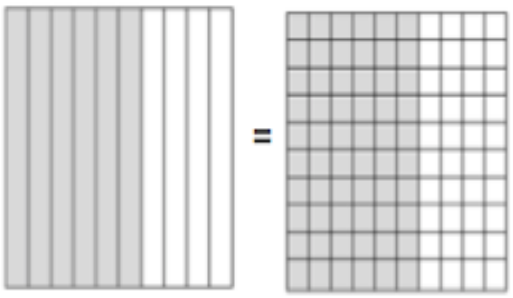
$$\frac{1}{10}$$

$$\frac{1}{100}$$

Equivalencies with Grids:



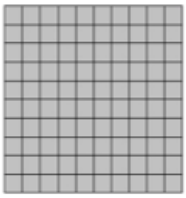
$$\frac{8}{10} = \frac{80}{100}$$



$$\frac{6}{10} = \frac{60}{100}$$

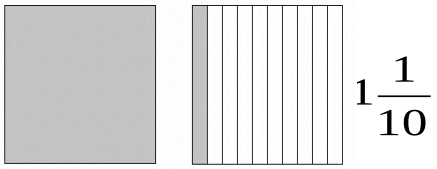
Wylie remembers that fractions representing 1 whole have numerators and denominators that are the same number.

$\frac{10}{10} = 1$ $\frac{100}{100} = 1$

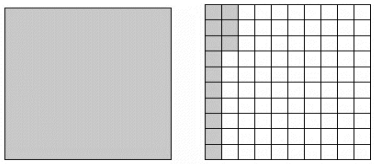


one whole one whole

The models below include a mixture of a whole numbers and a fraction. These are known as **mixed numbers.**

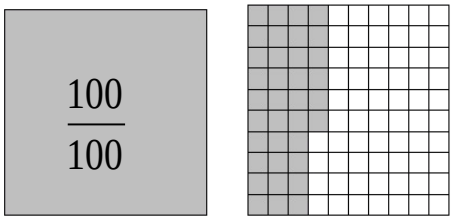


$1\frac{1}{10}$

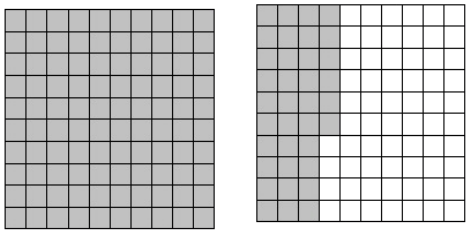


$1\frac{13}{100}$

A mixed number can be changed into an equivalent fraction. Because it includes 1 or more wholes, it is known as a **fraction greater than one (1).**



$1\frac{36}{100}$ =



$\frac{136}{100}$

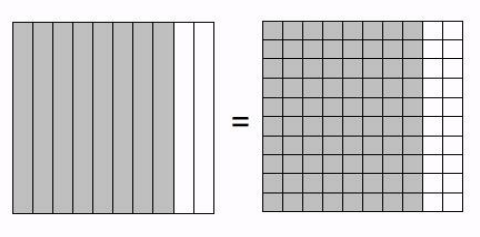
mixed numbers *fractions greater than 1*

$\frac{23}{10}$

$\frac{23}{10}$

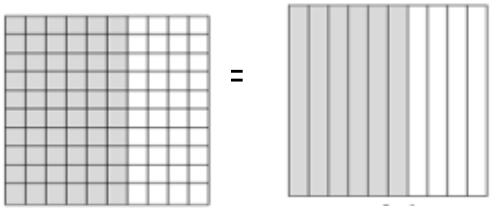
Write the equivalents fractions.

9.



_____ = _____

10.



_____ = _____

Using tenths or hundredths, write the equivalent fractions.

11.

$\frac{50}{100}$ = _____

12.

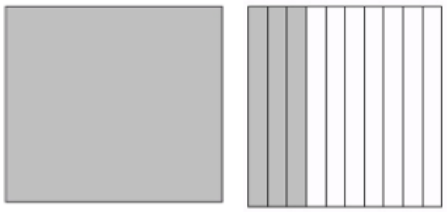
$\frac{2}{10}$ = _____

13.

$\frac{100}{100}$ = _____

Write the mixed numbers.

14.

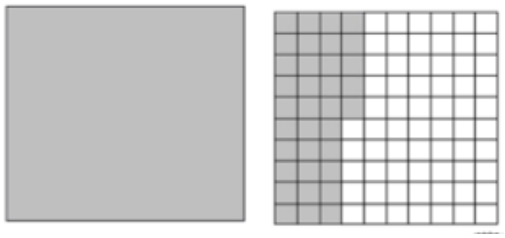


_____

15.

_____

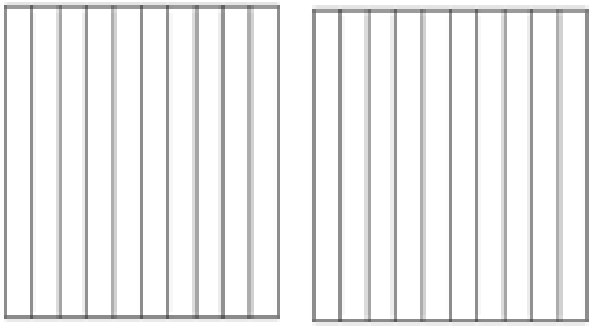
16.



_____

17. Open Response

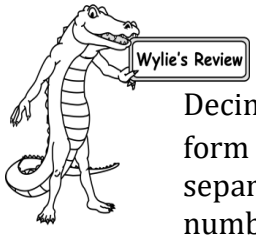
Shade in the mixed number. $1\frac{8}{10}$



Use Decimal Notation to Represent Fractions

Develop an understanding of the relationship between different fractions and the relationship between fractions and decimals.

Use decimal notation to represent fractions with denominators of 10 or 100, including mixed numbers and fractions greater than 1, and use fractional notation with denominators of 10 or 100 to represent decimals.



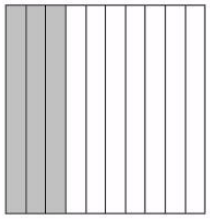
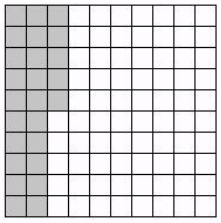
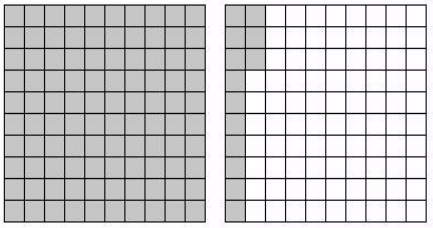
Decimal fractions can be represented in a form other than a fraction. This form is called **decimal notation.** In decimal notation, a decimal point (•) separates whole numbers from numbers that are less than one whole. These numbers are more commonly called **decimals**. Numbers to the right of the decimal point represent parts of a whole, while numbers to the left of the decimal point represent whole numbers.

Money, grids and number lines help us understand and connect how decimal notation can be used with decimal fractions.

	Decimal Fraction	Decimal Notation	Words
	$\frac{2}{10}$	0.2	two tenths of a dollar
	$\frac{20}{100}$	0.20	twenty hundredths of a dollar
	$1\frac{35}{100}$	1.35	one dollar and thirty-five hundredths of a dollar

Everglades K-12 Publishing's Florida B.E.S.T. Standards: Mathematics Grade 4
Fractions – MA.4.FR.1.2

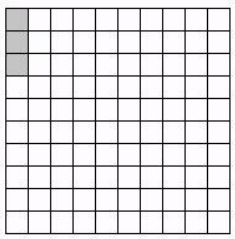
Visual models are used to help understand that decimal fractions can be written as decimals. The number of digits to the right of the decimal point is equal to the number of zeros in the denominator of the decimal fraction.

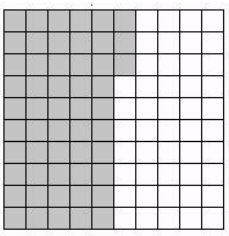
	Decimal Fraction	Decimal Notation	Words
	$\frac{3}{10}$	0.3	three tenths
	$\frac{25}{100}$	0.25	twenty-five hundredths
	$1\frac{13}{100}$	1.13	one and thirteen hundredths

---

Example 1: Write each of the following models as a decimal fraction and as a decimal.

a. 

b. 

c. 

Answers:

a. $\frac{75}{100}$ 0.75

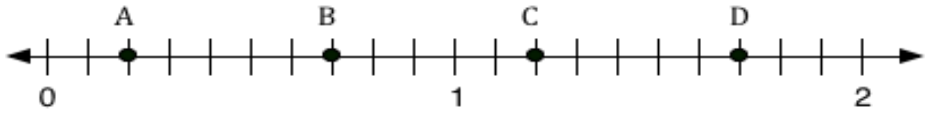
b. $\frac{3}{100}$ 0.03

c. $\frac{53}{100}$ 0.53

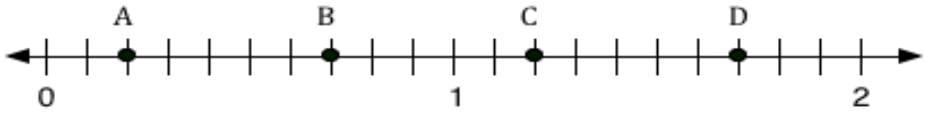
Example 3: Write a decimal fraction and a decimal for each of the points on the number lines below.

$\frac{2}{10}$ 0.2 $1\frac{7}{10}$ 1.7 $1\frac{2}{10}$ 1.2 $\frac{7}{10}$ 0.7

Decimal Fraction Number Line



Decimal Number Line

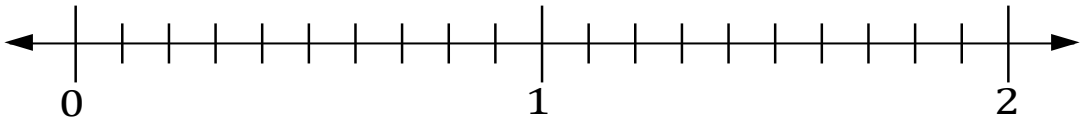


Answers:

A. $\frac{2}{10}$ and 0.2 B. $\frac{7}{10}$ and 0.7 C. $1\frac{2}{10}$ and 1.2 D. $1\frac{7}{10}$ and 1.7

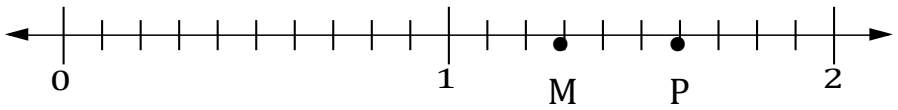
Example 4: Change the mixed number to a decimal and a fraction greater than 1. Then, plot them on the number line below.

Point M $1\frac{3}{10}$ = Point P $1\frac{6}{10}$ =



Answers:

$1\frac{3}{10}$ = 1.3 = $\frac{13}{10}$ $1\frac{6}{10}$ = 1.6 = $\frac{16}{10}$



Now Try These:

For 1- 8, Equation Editor
Write each of the following in decimal form.

1. $\frac{4}{10}$

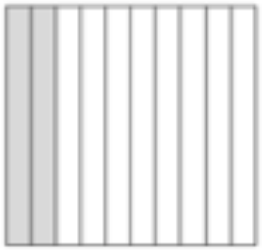
2. $\frac{4}{100}$

3. $5\frac{3}{10}$

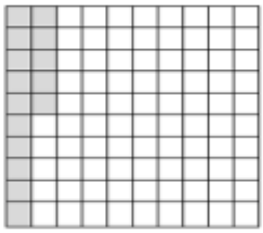
4. thirty-six hundredths

5. two and eighteen tenths

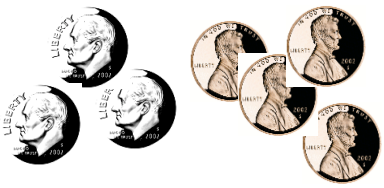
6.



7.



8.



9. Multiple Choice

Which decimal below is equivalent to $\frac{7}{100}$?

A. 7.100

B. 0.7

C. 0.700

D. 0.07

10. Multiselect

Select all of the choices that are equivalent to *nine tenths*.

A. 0.09

B. $\frac{90}{100}$

C. $\frac{9}{10}$

D. 0.9

E. $\frac{9}{100}$

For 11 - 13, Table Item

Complete this table with the equivalencies in each column.

	Decimal	**Fraction greater than 1**	**Mixed Number**
11.	**9.48**		
12.		$\mathbf{\frac{27}{10}}$	
13.			$\mathbf{4\frac{8}{10}}$

For 7-8, Multiple Choice

7. Mrs. Green purchased 2 packages of hamburger meat for a cookout. One package weighed $3\frac{3}{16}$ pounds. The other package weighed $3\frac{7}{16}$ pounds. How much meat did Mrs. Green buy?

A. $6\frac{10}{16}$

B. $6\frac{3}{16}$

C. $6\frac{19}{32}$

D. $6\frac{19}{16}$

8. Both Julie and Aisha run 5 mornings each week. Last week Julie ran $24\frac{3}{10}$ kilometers, and Aisha ran $29\frac{7}{10}$ kilometers. How many more kilometers did Aisha run?

A. $5\frac{10}{10}$

B. $5\frac{4}{10}$

C. $6\frac{4}{10}$

D. $6\frac{3}{10}$

For 9-12, Equation Editor

9. Isabel has standing broad jump practice after school. She jumped $5\frac{3}{12}$ feet on her first jump and on her second try, she jumped $6\frac{5}{12}$. What is the difference in her two jumps?

10. On a road trip, the Perez family purchased $25\frac{2}{3}$ gallons of gas. When they returned home, they had $3\frac{2}{3}$ gallons of gas. How many gallons did the Perez family use during the trip?

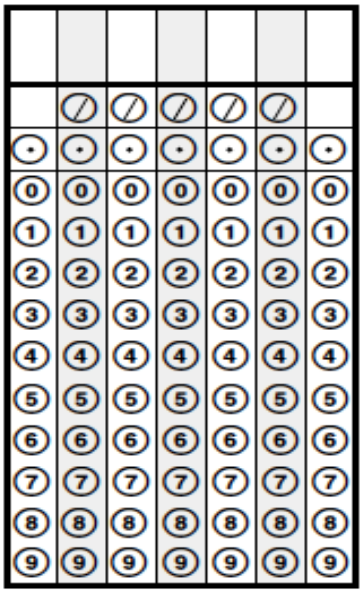
11. A cookie recipe uses $\frac{4}{4}$ teaspoon of salt, $\frac{2}{4}$ teaspoon of baking powder and $\frac{3}{4}$ teaspoon of cinnamon. How many teaspoons is this all together?

12. A punch recipe for the birthday party includes $3\frac{2}{6}$ cups of orange juice and $2\frac{4}{6}$ cups of pineapple juice. How many cups of juice are needed for the punch recipe?

13. Gridded Response

Three friends are gathering wild blueberries. Amanda picked $\frac{3}{5}$ cup, Andrew collected $\frac{4}{5}$ cup and Anna picked $\frac{2}{5}$ cup. How much did the 3 friends collect together?

Grid the sum, which is a fraction greater than one.



For 14-17, Equation Editor

14. Juan has a plank of wood that measures $4\frac{9}{12}$ yards. He cuts off $1\frac{7}{12}$ yards to use for trim. How long is the plank of wood now?

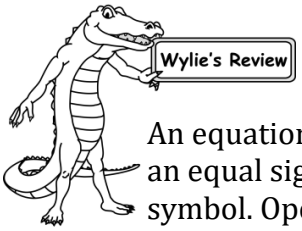
15. The Cruise Trail and East Trail are two popular bike paths. The East Trail is $16\frac{3}{10}$ miles. The Cruise Trail is $34\frac{7}{10}$ miles. How much longer is the Cruise Trail than the East Trail?

16. Carly has several bird feeders in her yard. She bought $5\frac{3}{8}$ pounds of birdseed. She used $2\frac{1}{8}$ pounds to fill the bird feeders. How much seed does Carly have left?

Determine if a Whole Number Equation is True or False

Demonstrate an understanding of equality and operations with whole numbers.

Determine and explain whether an equation involving any of the four operations is true or false.

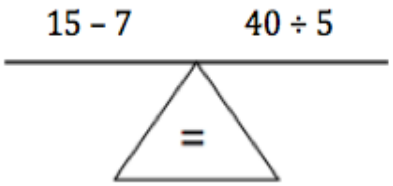


An equation is a mathematical sentence with an equal sign. Wylie knows that an equal sign is a relationship symbol and is quite different from an operation symbol. Operation signs (+, −, ×, and ÷) tell us to *do* something with the numbers in expressions and equations. An equal sign means *the same as* and shows the relationship of the numbers and values of the expressions on each side of the equation.

$15 - 7 = 40 \div 5$ $\qquad$ $(5 + 1) \times 4 = (9 \div 3) \times 8$

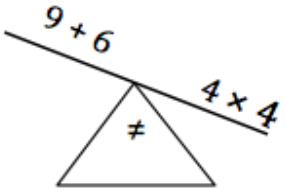
$8 = 8$ $\qquad$ $24 = 24$

Thinking of an equation on a balance scale helps show this very important relationship meaning of **equality** and the equal sign.



equal

(true)



not equal

(false)

Wylie wants you to remember and use the mathematics you have already learned to decide if an equation is true or false.

repeated addition with multiplication
identity property
zero property
commutative property
repeated subtraction with division
basic facts for all 4 operations

Example 1: Determine if the following equation is true or false and explain your reasoning. You may not always need to solve the equation.

$$40 \div 8 = 40 \div (4 \times 2)$$

Answers:

The equation is true because dividing by (4 × 2) is the same as dividing by 8

Example 2: Determine if the following equation is true or false and explain your reasoning. You may not always need to solve the equation.

$$25 - (16 \times 1) = 25 - (16 + 1)$$

Answers:

The equation is false. 25 –16 ≠ 25 – 17. The identity property of multiplication is 1. The identity property for addition is 0.

Example 3: Determine if the following equation is true or false and explain your reasoning. You may not always need to solve the equation.

$$42 + (13 + 0) = 42 + (13 \times 0)$$

Answer:

The equation is false. 42 + (13 + 0) ≠ 42 + (13 × 0). Zero does not change a number in addition, but any number multiplied by zero will equal zero. 42 + 13 ≠ 42

Now Try These:

For 1-2, Multiselect

1. Which of the following equations are true?

A. 65 – 5 = 68 – 8

B. 7 + 7 + 7 = 3 × 7

C. 27 ÷ 9 = 27 –9 –9

D. 35 + 40 + 2 = 70 + 7

E. 4 × 5 = 5 + 4

2. Which of the following equations are false?

A. 54 ÷ 9 = 54 ÷ (3 × 3)

B. 4 × 8 = 8 + 8 + 8

C. 20 + 15 = 20 + (15 × 1)

D. 11 × 4 = 45 – (1 × 0)

E. 2 × 4 + 6 = 2 × 6 + 4

For 3,5 and 7, Equation Editor

3. Determine if the following equation is true or false.

$37 + 29 - 29 = 37$

For 4,6, and 8, Open Response

4. Explain your thinking.

_____

_____

_____

_____

5. Determine if the following equation is true or false.

$43 - (8 \times 1) = 43 - (8 + 0)$

6. Explain your thinking.

_____

_____

_____

_____

7. Determine if the following equation is true or false.

$35 \div 7 = 35 \div (3 \times 4)$

8. Explain your thinking.

_____

_____

_____

_____

For 9 – 13, Matching Item
Check √ the box that goes with each equation.

		True	False
9.	16 ÷ 8 = 2 x 1		
10.	8 x 3 = 3 x 8		
11.	(2 x 2 + 3 = 56 ÷ 8)		
12.	6 x 6 = (9 – 3) x 0		
13.	3 + 7 = (5 x 3) -3		

14. Zachary worked 9 hours last weekend. His brother Mark worked 2 times or twice as many hours. How many hours "*h* "did Mark work?

15. Zachary worked 9 hours last weekend. His brother Mark worked 2 times or twice as many hours. How many hours "*h*" did Mark and Zachary work all together?

16. Jensen has 52 meters of rope. He cut the rope into 4 equal pieces? How many meters "*m*" long is each piece?

17. Write a different equation that could solve problem 16.

.

18. Courtney bought donuts to share with her friends. The donuts were packed in a box with 3 rows and 4 donuts in each row. How many donuts "*d* " did Courtney have to share?

For 19-20, Multiple Choice
Select an equation that could solve the problem.

19. Rajesh has 72 inches of orange yarn. He needs to cut the yarn into pieces that are 8 inches long. How many pieces "*y* " will Rajesh be able to make?

A. $72 - 8 = y$

B. $8 \times 72 = y$

C. $8 \times y = 72$

D. 8 **+** y = 72

20. Janice is wrapping birthday gifts for her sister. Each bow uses 3 feet of ribbon. Janice wrapped 8 packages. How many feet of ribbon "*r* " did she use?

A. $3 \times 8 = r$

B. $3 \times r = 8$

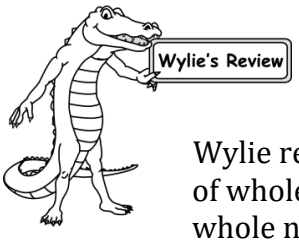
C. $8 + 3 = r$

D. $3 + r = 8$

Determine Factor Pairs and Identify Prime and Composite Numbers

Recognize numerical patterns, including patterns that follow a given rule

Determine factor pairs for a whole number from 0 to 144. Determine whether a whole number from 0 to 144 is prime, composite or neither

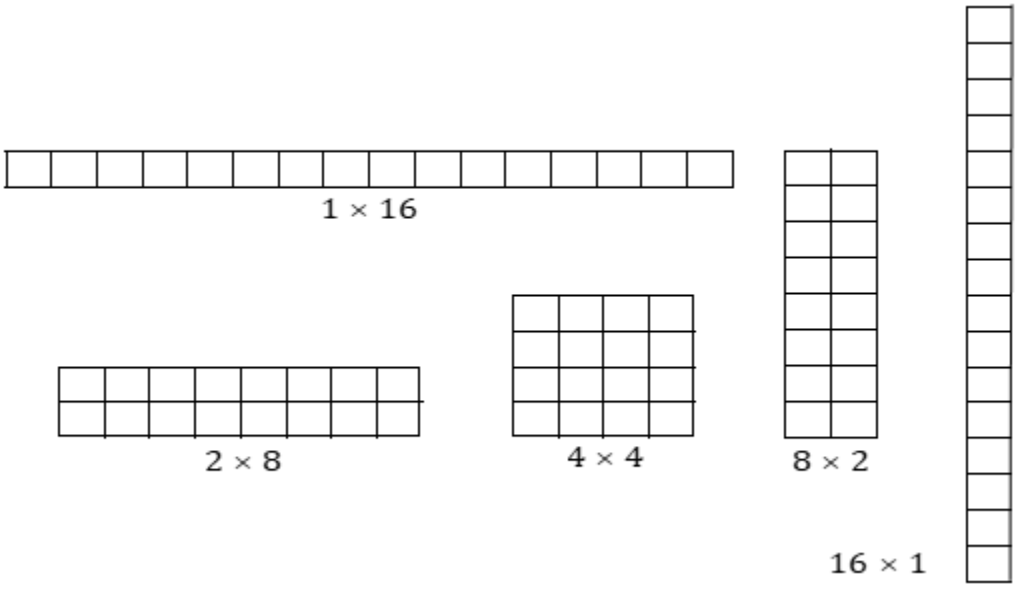


Wylie realizes that **factors** and **multiples** are sometimes confused. *Multiples* of whole numbers are numbers that are a result or product of multiplying the whole number by a set of counting numbers. The multiples of 4 can be found by multiplying 4 by the counting numbers 1, 2, 3, 4, 5, ….

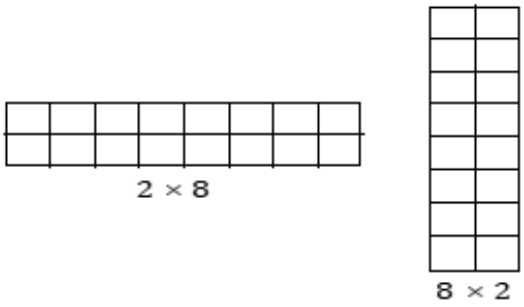
1 x 4 = 4	3 x 4 = 12	5 x 4 = 20	7 x 4 = 28
2 x 4 = 8	4 x 4 = 16	6 x 4 = 24	8 x 4 = 32, and so on.

The multiples of 4 are 4, 8, 12, 16, 20, 24, 28, 32, and so on. There are many, many multiples of a whole number as the counting numbers keep going on.

One way to find the **factors** of a whole number is to build arrays or rectangular arrangements of objects. The whole number is the *product* and the *factors* determine all the ways to form that specific product. Wylie built the following arrays for the product 16.



Looking at the arrays, 2 × 8 and 8 × 2 are numbers that pair together to make the product of 16. These are called a **factor pair** for 16. Another factor pair for 16 is 1 and 16.



The following describes all of the arrays that can be created for a product of 16.

1 × 16 and 16 × 1
2 × 8 and 2 × 8
4 x 4

Factor pairs for 16 are: 1 and 16, 2 and 8, 4 and 4

Factors of 16 are: 1, 2, 4, 8, 16

The numbers 1, 2, 4, 8, and 16 are called the factors of 16 because they are the only whole numbers that can be multiplied to equal 16.

Determining all the factor pairs that can be multiplied to get a certain product will also find all of the factors for a number. Think of the pairs of whole numbers that can be multiplied to get a product of 12.

There are three factor pairs for 12:

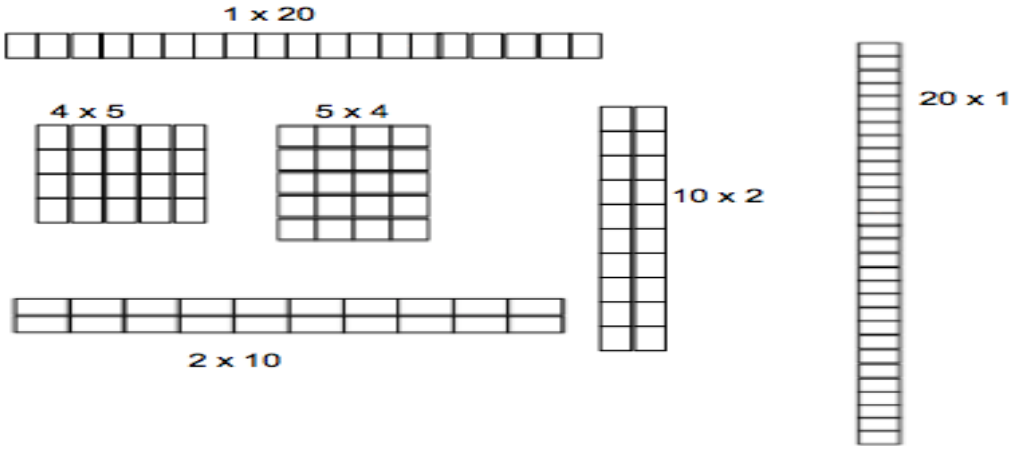
<u>1 and 12</u>	<u>2 and 6</u>	<u>3 and 4</u>
1 × 12 or 12 × 1	2 × 6 or 6 × 2	3 × 4 or 4 × 3

The factors of 12 are 1, 2, 3, 4, 6, and 12.

Wylie has two helpful hints in finding factor pairs. He reminds us that all even numbers will have a factor pair with 2, and numbers ending in 0 or 5 will have a factor pair with 5.

Example 1: Make arrays to show the factors for 20 and determine the factor pairs.

Answers:



Factors are: 1,2,4,5,10,20 The factor pairs are: 1 and 20, 2 and 10, 4 and 5.

Example 2: Lori is building arrays with 36 tiles to determine factor pairs. Which of the following factor pairs should Lori find?

a. 1 and 36 b. 2 and 13 c. 6 and 6 d. 4 and 9 e. 5 and 7

There are 2 more factor pairs for 36. What are they?

Answers:

Lori should find a, c, and d. 2 more factor pairs are 2 and 18, 3 and 12

A **prime number** is a whole number greater than 1 with exactly 2 different factors. These factors are 1 and the number itself. A **composite number** is a whole number greater than 1 with more than 2 factors.

Prime Numbers		Composite Numbers	
7	Factors: 1, 7	9	Factors: 1, 3, 9
19	Factors: 1, 19	16	Factors: 1, 2, 4, 8, 16
23	Factors: 1, 23	27	Factors: 1, 3, 9, 27
67	Factors: 1, 67	54	Factors: 1, 2, 3, 6, 9, 18, 27, 54

Wylie reminds us that the number 2 is the only even prime number. All other even numbers have 2 as one of their factors. Some people think that 1 is a prime number, but it does not have exactly 2 different factors. It is not a composite number either, as the number 1 does not have more than 2 factors. The whole number 1 is a special number that is neither prime nor composite.

Example 3:

Which of the following lists all of the prime numbers between 40 and 50?

a. 41, 43, 47 b. 41, 47, 49 c. 42, 46, 48 d. 42, 43, 49

Which set of numbers includes a prime and a composite number?

a. 9, 21 b. 15, 32 c. 11, 23 d. 2, 27

The prime numbers between 40 and 50 are a. 41,43,47.

Choice d includes a prime and a composite number. 2 is a prime numbers with factors 1 and 2. 27 is a composite number with factors 1, 3, 9, and 27.

Example 4: In his math journal, Ezra described the number 39 as odd and prime. Was Ezra correct? Explain why or why not.

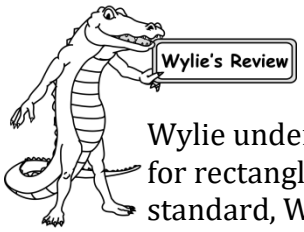
Answer:

Ezra was partly correct. 39 is an odd number, but it is a composite number (not prime) because it has more than 2 factors. The factors of 39 are 1, 3, 13, and 39

Solve Problems with Same/Different Areas and Perimeters

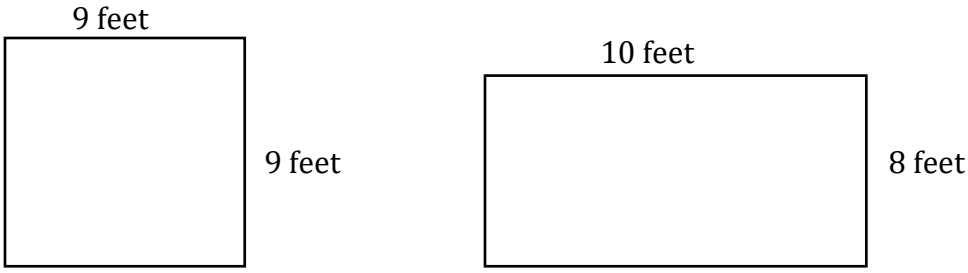
Solve problems involving the perimeter and area of rectangles.

Solve problems involving rectangles with the same perimeter and different areas or the same areas and different perimeters.



Wylie understands how to measure area and perimeter and use the formulas for rectangles (A = l x w and P = l + l + w + w or P = 2 × l + 2 × w). In this standard, Wylie will be working with various lengths and widths as well as areas and perimeters to solve some complex problems and apply reasoning skills.

Examine these 2 different ways to show a perimeter of 36 ft.



P = 9 + 9 + 9 + 9 P = 10 + 10 + 8 + 8

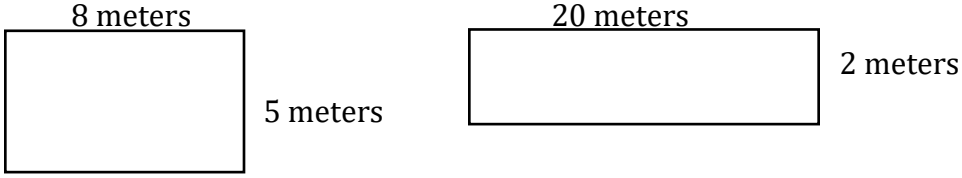
Now calculate the area of each rectangle.

A = 9 × 9 A = 10 × 8

A = 81 square feet A = 80 square feet

These polygons have the same perimeter with different areas.

Examine these 2 different ways to show an area of 40 square meters



A = 8 × 5 A = 20 × 2

A = 40 square meters A = 40 square meters

Now calculate the perimeter of each rectangle.

P = 8 + 8 + 5 + 5 P = 20 + 20 + 2 + 2

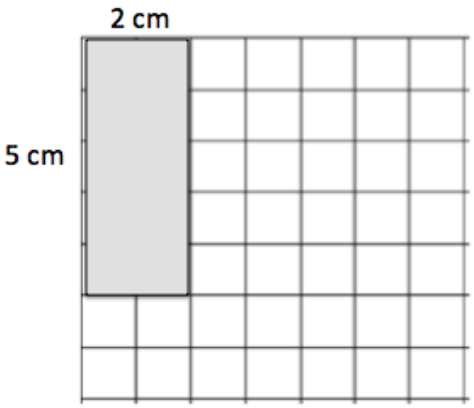
P = 26 meters P = 44 meters

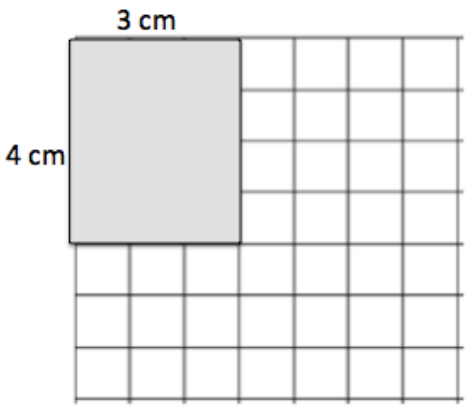
The above polygons have the same areas with different perimeters.

Grid Paper and Factor Pairs are very useful problem solving aids for area and perimeter.

Drawing on grid paper makes it easier to explore different areas and perimeters.

Perimeters = 14 cm





A = 10 square cm. A = 12 square cm.

Factor pairs provide connected numbers to use for lengths and widths.

3 and 8, 4 and 6, 2 and 12, 24 and 1 are factor pairs for 24.

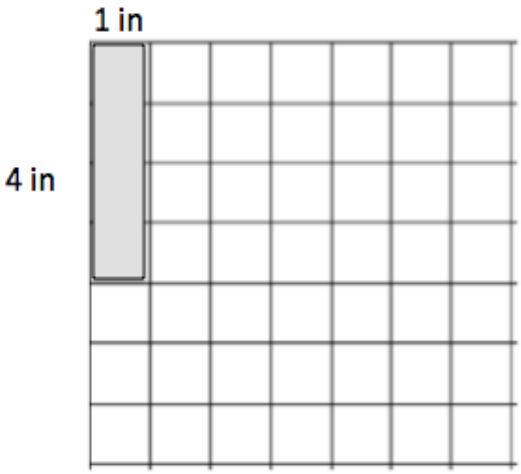
Areas = 24 square inches

P = 28 in P = 20 in

Now Try These:

For 1 - 8, Equation Editor

1. Calculate the perimeter and area of the shaded rectangle.



P = _____ inches

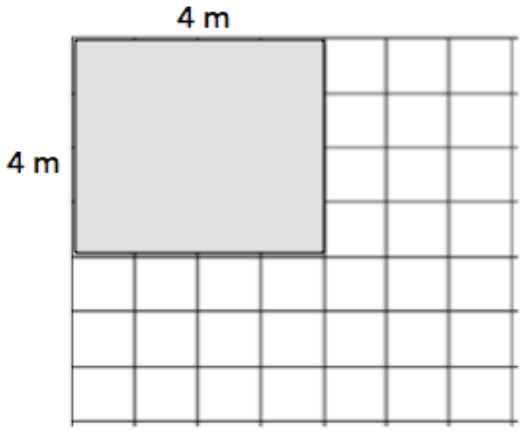
A = _____ square inches

2. Create a rectangle with the same perimeter but a different area in problem 1.

P = _____ inches

A = _____ square inches

3. Calculate the perimeter and area of the shaded rectangle.



P = _____ meters

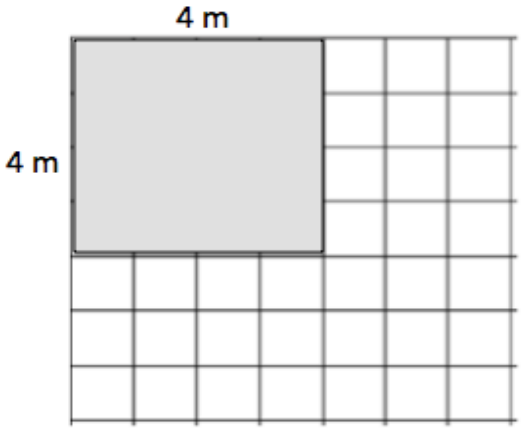
A = _____ square meters

4. Create a rectangle with the same perimeter but a different area in problem 2.

P = _____ meters

A = _____ square meters

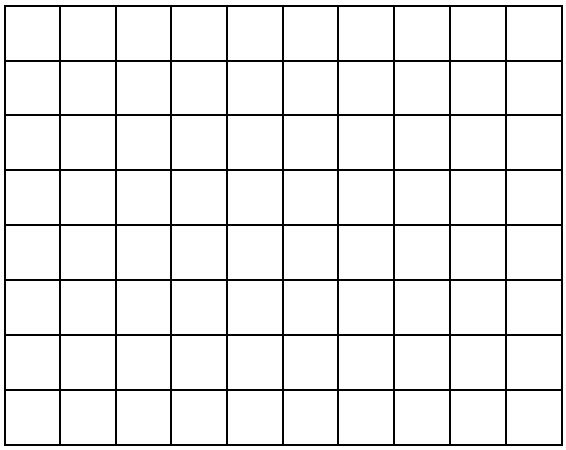
5. Calculate the perimeter and area of the shaded rectangle.



P = _____ meters

A = _____ square meters

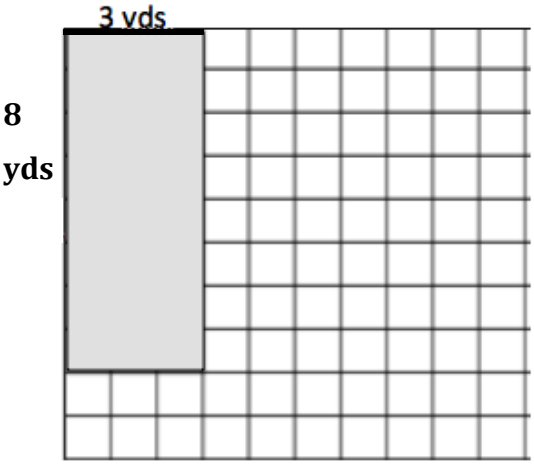
6. Create a rectangle with the same area but a different perimeter in problem 5.



P = _____ meters

A = _____ square meters

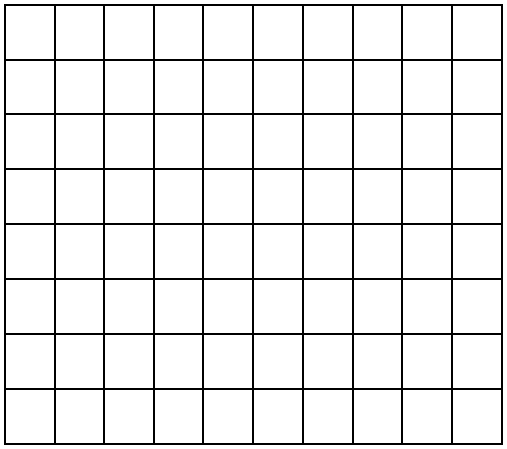
7. Calculate the perimeter and area of the shaded rectangle.



P = _____ yards

A = _____ square yards

8. Create a rectangle with the same area but a different perimeter in problem 7.



P = _____ yards

A = _____ square yards