Key

Math 6

Colonial School District

Summer Math Packet 2008-2009

The concepts included in this packet will help reinforce key skills your child has encountered in math this year. Please encourage them to complete as many activities as possible as it will lead to greater success next year. The answer key to this packet is available on the district website (www.colonialsd.org).

Name Key Date

Study Guide Worksheet 8-3

Triangles and Quadrilaterals

Triangles may be classified by the measures of their angles.

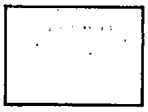
Classification by Angle	
Acute	all angles acute
Right	one right angle
Obtuse	one obtuse angle

Classification by Sides	
Scalene	all sides different lengths
Isosceles	two sides the same length
Equilateral	three sides the same length

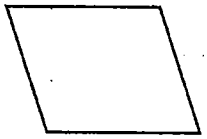
Sides and angles are also used to classify quadrilaterals.

Trapezoid
only one pair of parallel sides

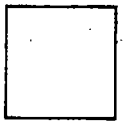
Parallelogram
both pairs of opposite sides parallel



Rectangle
a parallelogram with four right angles

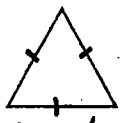


Rhombus
a parallelogram with four sides the same length

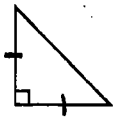


Square
a parallelogram with four right angles and four sides the same length

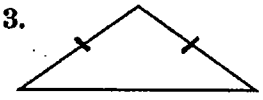
Classify each triangle by its sides and by its angles.

1. 

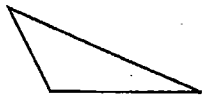
Equilateral
Acute

2. 

Isosceles
Right

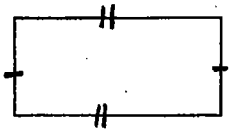
3. 

Isosceles
Obtuse

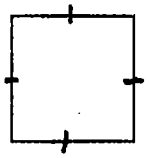
4. 

Scalene
Obtuse

Name every quadrilateral that describes each figure. Then state which name best describes the figure.

5. 

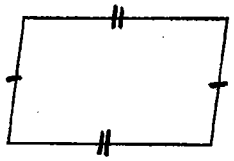
Parallelogram
(Rectangle)

6. 

Parallelogram
Rectangle
Rhombus
(Square)

7. 

Trapezoid

8. 

Parallelogram

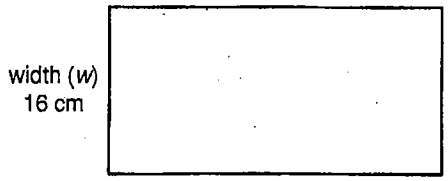
Glencoe Division, Macmillan/McGraw-Hill

Name Key Date

Study Guide Worksheet 6-7

Geometry Connection: Area

Rectangle

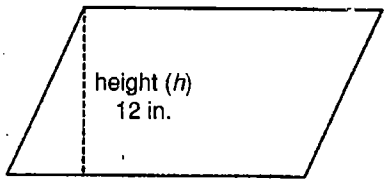


The area of a rectangle equals the product of its length and its width.

$A = lw$

$A = lw$
$A = 40 \cdot 16$
$A = 640 \text{ cm}^2$

Parallelogram



The area of a parallelogram equals the product of its base and its height.

$A = bh$

$A = bh$
$A = 30 \cdot 12$
$A = 360 \text{ in}^2$

Find the area of each figure shown or described below.

1. 6 cm, 14 cm — $14 \times 6 = 84 \text{ cm}^2$

2. 8 yd, 3 yd — $8 \times 3 = 24 \text{ yd}^2$

3. 7 mm, 12 mm — $12 \times 7 = 84 \text{ mm}^2$

4. $2\frac{1}{2}$ in., 8 in. — $8 \times 2.5 = 20 \text{ in}^2$

5. 3.5 yd, 5 yd — $3.5 \times 5 = 17.5 \text{ yd}^2$

6. 6 ft, 7.5 ft — $7.5 \times 6 = 45.0 \text{ ft}^2$

7. parallelogram: $b = 15$ ft, $h = 21$ ft $15 \times 21 = 315 \text{ ft}^2$

8. rectangle: $l = 7.5$ cm, $w = 12$ cm $7.5 \times 12 = 90 \text{ cm}^2$

9. parallelogram: $b = 4.7$ m, $h = 2.2$ m $4.7 \times 2.2 = 10.34 \text{ m}^2$

10. rectangle: $l = 1\frac{1}{4}$ yd, $w = \frac{1}{2}$ yd $1.25 \times .25 = 0.625 \text{ yd}^2$ or $\frac{5}{4} \times \frac{1}{2} = \frac{5}{8} \text{ yd}^2$

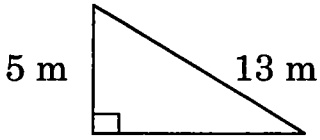
Glencoe Division, Macmillan/McGraw-Hill

Name Key

Measurement: Area of Triangles and Trapezoids

Part I: Find the area of each triangle.

Area: measure of what is inside



$A = \frac{1}{2}$ (b x h)
$= \frac{1}{2}$ (5 x 12)
$= 30$ m^2

✶ **TIP:** *The base and height of a triangle will always be perpendicular.*

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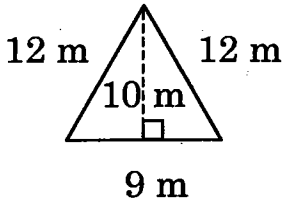
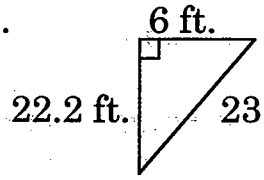
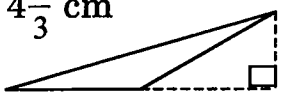
1. 

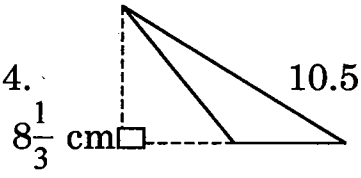
$\frac{1}{2}(9 \times 10)$
$\frac{1}{2}(90)$
$= 45\ m^2$

2. 

$\frac{1}{2}(6 \times 22.2)$
$= \frac{1}{2}(133.2)$
$= 66.6\ ft^2$

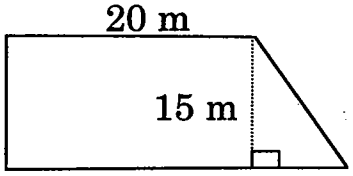
3. 

$\frac{1}{2}(2\frac{1}{3} \times 1\frac{5}{6})$
$= \frac{1}{2}(\frac{7}{3} \times \frac{11}{6})$
$= \frac{1}{2}(\frac{77}{18})$
$= \frac{77}{32} = 2\frac{13}{32}\ cm^2$

4. 

$\frac{1}{2}(6\frac{1}{2} \times 8\frac{1}{3})$
$= \frac{1}{2}(\frac{13}{2} \times \frac{25}{3})$
$= \frac{1}{2}(\frac{325}{6})$
$= \frac{325}{12} = 27\frac{1}{12}\ cm^2$

Part II: Find the area of each trapezoid.



$A = \frac{1}{2}h\,(a + b)$, where h is the height and a and b are the bases.

$\frac{1}{2}(15)(20 + 24) = 330\ m^2$

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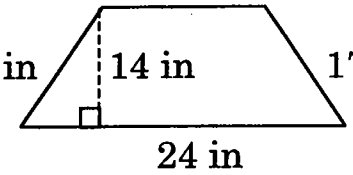
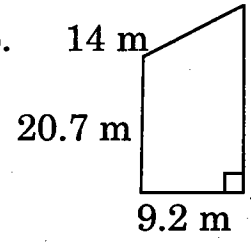
5. 

$\frac{1}{2} \cdot 14(10 + 24)$
$= 7(34)$
$= 238\ in^2$

6. 

$\frac{1}{2} \cdot 9.2(27 + 20.7)$
$= 4.6(47.7)$
$= 219.42\ m^2$

7. bases: 12 m, 18 m
height: 10 m

$\frac{1}{2} \cdot 10(12 + 18)$
$= 5(30)$
$= 150\ m^2$

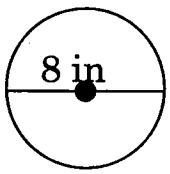
8. bases: $6^1/_2$ ft, $11^2/_3$ ft
height: 14 ft

$\frac{1}{2} \cdot 14(6\frac{1}{2} + 11\frac{2}{3})$
$= 7(18\frac{1}{6})$
$= \frac{7}{1} \cdot \frac{109}{6} = \frac{763}{6}$
$= 127\frac{1}{6}\ ft^2$

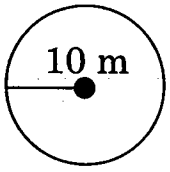
Name Key

Measurement: Circumference & Area of Circles

Find the circumference and area of each circle. Use 3.14 for π.
Round to the nearest hundredth.

Circumference: Distance around 

$C = \pi \times d$
$= 3.14 \times 8$
$= 25.12$ in

Area: What's inside 

$A = \pi \times r^2$
$= 3.14 \times 10^2$
$= 314$ m^2

TIP: *Remember that the diameter is twice the radius. d = 2r.*

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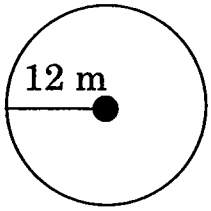
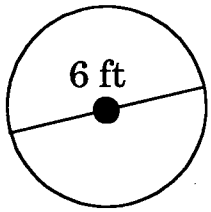
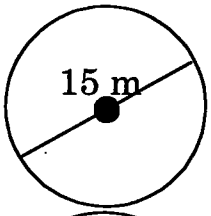
1. 

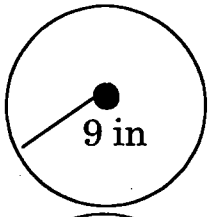
$C = 3.14 \times 24 = 75.36$ m
$A = 3.14 \times 12 \times 12 = 452.16$ m^2

2. 

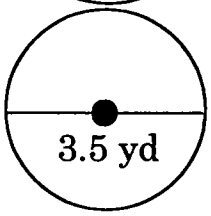
$C = 3.14 \times 6 = 18.84$ ft
$A = 3.14 \times 3 \times 3 = 28.26$ ft^2

3. 

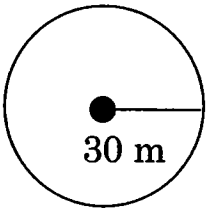
$C = 3.14 \times 15 = 47.1$ m
$A = 3.14 \times 7.5 \times 7.5$
$= 176.625$
≈ 176.63 m^2

4. 

$C = 3.14 \times 18 = 56.52$ in
$A = 3.14 \times 9 \times 9 = 254.34$ in^2

5. 

$C = 3.14 \times 3.5 = 10.99$ yd
$A = 3.14 \times 1.75 \times 1.75$
$= 9.61625$
≈ 9.62 yd^2

6. 

$C = 3.14 \times 60 = 188.4$ m
$A = 3.14 \times 30 \times 30 = 2826$ m^2

7. d = 7.2 yd

$C = 3.14 \times 7.2 = 22.608 \approx 22.61$ yd
$A = 3.14 \times 3.6 \times 3.6$
$= 40.6944$
≈ 40.69 yd^2

8. r = 7 in

$C = 3.14 \times 14 = 43.96$ in
$A = 3.14 \times 7 \times 7 = 153.86$ in^2

THINK ABOUT IT!

9. A circle has a circumference of 100 in. What is its area?

$100 = 3.14d$
$31.8 = d$

$a = 3.14(15.9)(15.9)$
≈ 793.8 in^2

Key

Decimals

Adding and Subtracting

RULE	EXAMPLE
1. Line up the decimal points. 2. Add zeros if necessary. 3. Add or subtract. **NOTE:** Remember to bring down your decimal point into your answer!	33.4 − 3.82 33.40 − 3.82 29.58

Find each sum or difference.

1. 3.956 + 2.41

$$\begin{array}{r} 3.956 \\ +\ 2.41 \\ \hline 6.366 \end{array}$$

2. 0.0589 + 0.278

$$\begin{array}{r} 0.0589 \\ +\ 0.278 \\ \hline 0.3369 \end{array}$$

3. 117 + 105.02

$$\begin{array}{r} 117.00 \\ +\ 105.02 \\ \hline 222.02 \end{array}$$

4. 6.788 − 0.2

$$\begin{array}{r} 6.788 \\ -0.200 \\ \hline 6.588 \end{array}$$

5. 3.24 − 0.51

$$\begin{array}{r} 2\not{3}.24 \\ -0.51 \\ \hline 2.73 \end{array}$$

6. 117 − 105.0023

$$\begin{array}{r} 11\not{7}.\not{0}\not{0}\not{0}0 \\ -\ 105.0023 \\ \hline 11.9977 \end{array}$$

Key

Decimals

Multiplying

RULE	EXAMPLE
1. Multiply as you would whole numbers. 2. Count the number of digits to the right of the decimal point in each number. 3. In your answer, count from the right to the left that number of places and put your decimal point. **NOTE:** Remember, do NOT line up the decimal point when setting up your problem!	62.8 x 0.93 62.8 *1 decimal place* x .93 *2 decimal places* 1884 56520 58.404 *3 decimal places*

Find each product.

1. 0.6 x 0.8

0.6
0.8
0.48

2. 0.9 x 0.27

0.27
x 0.9
0.243

3. 18.3 x 0.67

18.3
x 0.67
1281
10980
12.261

4. 7.2 x 5.4

7.2
x 5.4
288
3600
38.88

5. 8.4 x 0.003

8.4
x 0.003
0.0252

6. 0.04 x 0.3

0.04
x 0.3
0.012

Key

Decimals

Dividing

RULE	EXAMPLE
1. Change the divisor to a whole number by moving the decimal point to the right. 2. Move the decimal point in the dividend the same number of places. Add zeros if necessary. 3. Divide. **NOTE:** Remember to bring your decimal point up into your answer!	$3.9 \div 0.13$ $0.13\overline{)3.9}$ $13\overline{)390}$ $30.$ 39

Find each quotient.

1. $82 \div 0.4$

$$0.4\overline{)820} = 205$$

2. $2.38 \div 3.5$

$$3.5\overline{)2.380} = 0.68$$

3. $121.8 \div 1.4$

$$1.4\overline{)121.8} = 87$$

4. $0.0092 \div 8$

$$8\overline{)0.00920} = 0.0015$$

5. $149.73 \div 0.23$

$$0.23\overline{)149.73} = 651$$

6. $2.004 \div 0.2$

$$0.2\overline{)2.004} = 10.02$$

Key

Decimals

Problem Solving

RULE

4–Step Plan for Problem Solving

1. Explore. You need to read the problem and know what information you have and need and what is asked.
2. Plan. Develop a plan to solve the problem. Chose a strategy. Often it is helpful to make an estimate.
3. Solve. Carry out your plan
4. Examine. Be sure to label your answer appropriately. Check your answer by comparing to your estimate. If the answer does not make sense, make a new plan and try again.

*** NOTE: ***

Remember in most cases there is more than one way to solve the problem!

1. Megan has $80 to spend on clothes for school. After looking at the ads, she decides to buy two pairs of jeans for $29.99 each and two tank tops for $8.18 each. Does she have enough money to buy three new hair clips that are on sale 3 for $10?

$2 \times 29.99 = 59.98$

$2 \times 8.18 = 16.36$

80.00
-76.34
$\$3.66$ left

No - she only has $3.66 left which is less than $10.

2. Paula calls her grandparents long distance in California and talks for 45 minutes. The phone company charges $0.05 per half—minute. How much does the call cost?

$\$0.05$ per $\frac{1}{2}$ minute $= \$0.10$ per minute

$\$0.10/\text{min} \times 45 \text{ min} = \$4.50$

3. Ms. Francis drove her car 427 miles on 15.8 gallons of gas.
   a. To the nearest mile, how many miles per gallon is this?
   b. What was the cost of the gasoline she used if the price was $1.96 per gallon?

a. $427 \div 15.8 = 27.025 \approx 27$ miles per gallon

b. $15.8 \times 1.96 = 30.968$

$\approx \$30.97$

Key

Fractions

Adding and Subtracting

RULE	EXAMPLE
1. Find the lowest common denominator (LCD). 2. Write equivalent fractions using the LCD. 3. Add or subtract the numerators. Write the sum or difference over the LCD. 4. Reduce if necessary.	$\frac{5}{6}+\frac{3}{8}$ LCD = 24 $\frac{5}{6}=\frac{20}{24}$ $+\ \frac{3}{8}=\frac{9}{24}$ $\frac{29}{24}=1\frac{5}{24}$

Find each sum or difference.

1. $\frac{2}{7}+\frac{3}{8}$

$\frac{16}{56}+\frac{21}{56}=\frac{37}{56}$

2. $\frac{1}{6}+\frac{3}{5}$

$\frac{5}{30}+\frac{18}{30}=\frac{23}{30}$

3. $\frac{5}{16}-\frac{2}{9}$

$\frac{45}{144}-\frac{32}{144}$

$\frac{13}{144}$

4. $\frac{3}{4}-\frac{5}{12}$

$\frac{9}{12}-\frac{5}{12}=\frac{4}{12}=\frac{1}{3}$

5. $3\frac{6}{7}+4\frac{1}{8}$

$3\frac{48}{56}+4\frac{7}{56}$

$7\frac{55}{56}$

6. $4\frac{3}{5}-2\frac{2}{3}$

$4\frac{9}{15}-2\frac{10}{15}$

*borrow $3\frac{24}{15}-2\frac{10}{15}$

$1\frac{14}{15}$

Improper fractions

OR $\frac{69}{15}-\frac{40}{15}$

$\frac{29}{15}=1\frac{14}{15}$

Key

Fractions

Multiplying

RULE	EXAMPLES	
1. Write any mixed numbers as improper fractions. 2. Multiply the numerators. 3. Multiply the denominators. 4. Reduce if necessary.	$\frac{3}{10}\times\frac{2}{3}$ $\frac{6}{30}$ $=\frac{1}{5}$	$3\frac{5}{8}\times\frac{3}{7}$ $\frac{29}{8}\times\frac{3}{7}$ $\frac{87}{56}$ $=1\frac{31}{56}$

Find each product.

1. $\frac{1}{3}\times\frac{1}{3} = \frac{1}{9}$

2. $\overset{1}{\cancel{3}}\frac{\cancel{2}}{\cancel{9}}\times\frac{\cancel{2}^{1}}{\cancel{8}_{4}} = \frac{1}{12}$

OR

$\frac{2}{9}\times\frac{3}{8} = \frac{6}{72} = \frac{1}{12}$

3. $\frac{3}{10}\times\frac{2}{3} = \frac{6}{30} = \frac{1}{5}$

OR

$\overset{1}{\cancel{5}}\frac{\cancel{3}}{\cancel{10}}\times\frac{\cancel{2}^{1}}{\cancel{3}_{1}} = \frac{1}{5}$

4. $1\frac{3}{4}\times 7$

$\frac{7}{4}\times\frac{7}{1} = \frac{49}{4} = 12\frac{1}{4}$

5. $4\frac{4}{5}\times 3\frac{3}{4}$

$\frac{24}{5}\times\frac{15}{4} = \frac{360}{20} = 18$

OR

$\overset{6}{\cancel{15}}\frac{\cancel{24}}{\cancel{5}}\times\frac{\cancel{15}^{3}}{\cancel{4}_{1}} = \frac{18}{1} = 18$

6. $\frac{4}{5}\times\frac{1}{3}\times\frac{5}{12} = \frac{20}{180} = \frac{1}{9}$

OR

$\overset{1}{\cancel{15}}\frac{\cancel{4}}{\cancel{5}}\times\frac{1}{3}\times\frac{\cancel{5}^{1}}{\cancel{12}_{3}} = \frac{1}{9}$

Fractions

Key

Dividing

RULE	EXAMPLES
1. Write any mixed numbers as improper fractions. 2. Change the 2nd fraction to its reciprocal. (i.e. flip it over) 3. Multiply. 4. Reduce if necessary.	$\frac{3}{10} \div \frac{2}{3}$ $\frac{3}{10} \times \frac{3}{2}$ $= \frac{9}{20}$ $3\frac{5}{8} \div \frac{3}{7}$ $\frac{29}{8} \times \frac{7}{3}$ $\frac{203}{24}$ $= 8\frac{11}{24}$

Find each quotient.

1. $\frac{1}{3} \div \frac{1}{6} = \frac{1}{3} \times \frac{6}{1} = \frac{6}{3} = (2)$

2. $\frac{5}{8} \div \frac{1}{16} = \frac{5}{8} \times \frac{16}{1}$
$= \frac{80}{8} = (10)$

3. $\frac{5}{12} \div \frac{3}{16} = \frac{5}{12} \times \frac{16}{3}$
$= \frac{80}{36} = 2\frac{8}{36}$
$= (2\frac{2}{9})$

4. $2 \div 1\frac{1}{4} = \frac{2}{1} \div \frac{5}{4} = \frac{2}{1} \times \frac{4}{5}$
$= \frac{8}{5} = (1\frac{3}{5})$

5. $1\frac{1}{3} \div 2\frac{5}{6}$
$\frac{4}{3} \div \frac{17}{6} = \frac{4}{3} \times \frac{6}{17}$
$= \frac{24}{51} = (\frac{8}{17})$

6. $11\frac{3}{4} \div 5\frac{3}{4}$
$\frac{47}{4} \div \frac{23}{4} = \frac{47}{4} \times \frac{4}{23}$
$= \frac{47}{23} = (2\frac{1}{23})$

Key

Fractions

Problem Solving

RULE

4–Step Plan for Problem Solving

1. **Explore.** You need to read the problem and know what information you have and need and what is asked.
2. **Plan.** Develop a plan to solve the problem. Chose a strategy. Often it is helpful to make an estimate.
3. **Solve.** Carry out your plan
4. **Examine.** Be sure to label your answer appropriately. Check your answer by comparing to your estimate. If the answer does not make sense, make a new plan and try again.

NOTE:

Remember in most cases there is more than one way to solve the problem!

1. The total length of the bicycle race track is $\frac{5}{8}$ mile. The first $\frac{1}{5}$ mile is hilly and the rest is flat. What fraction of the course is flat?

$\frac{5}{8} - \frac{1}{5} = \frac{25}{40} - \frac{8}{40} = \frac{17}{40}$ mi

2. The cooking instructions for a turkey recommend roasting the turkey at a low temperature for $\frac{3}{4}$ hour for each pound. How long should you cook a 10 $\frac{1}{2}$ pound turkey?

$10\frac{1}{2} \times \frac{3}{4} = \frac{21}{2} \times \frac{3}{4} = \frac{63}{8} = 7\frac{7}{8}$ hr

3. In one year, 120 students enrolled at a community college. This was $\frac{3}{5}$ of the number of students accepted. How many of those accepted did not enroll?

$120 \div \frac{3}{5} = \frac{120}{1} \times \frac{5}{3} = \frac{600}{3} =$ 200 students

Percent Key

Conversions

RULE	EXAMPLE
Fraction to Percent 1. Change the fraction to a decimal. (numerator ÷ denominator) 2. Change the decimal to a percent. (Multiply by 100) 3. Label with a percent sign.	$\frac{3}{8}$ $3 \div 8 = 0.375$ $0.375 \times 100 = 37.5\ \%$

Express each fraction as a percent.

1. $\frac{24}{25} = \frac{96}{100}$ 96%

2. $\frac{2}{5} = \frac{40}{100}$ 40%

3. $\frac{40}{125}$ $40 \div 125 = 0.32$, $0.32 \times 100 = 32\%$

4. $\frac{2}{3}$ $2 \div 3 = 0.666\ldots$, $0.\overline{6} \times 100 = 66.\overline{6}\%$ or $66\frac{2}{3}\%$

RULE	EXAMPLE
Percent to Fraction 1. Write the number over 100. (no % symbol) 2. Reduce the fraction.	15% $\frac{15}{100}$ $= \frac{3}{20}$

Express each percent as a fraction.

5. 20% $\frac{20}{100} = \frac{1}{5}$

6. 72% $\frac{72}{100} = \frac{18}{25}$

7. 70% $\frac{70}{100} = \frac{7}{10}$

8. 2% $\frac{2}{100} = \frac{1}{50}$

Key

Simplifying Fractions

When you find the answer to a problem with fractions, you might need to change the fraction to an equivalent fraction in simplest terms. To **simplify** a fraction, divide both the numerator and the denominator by the same greatest number possible.

Simplify: $\boxed{\frac{8}{14}}$

Consider the numerator and denominator.

$\frac{8}{14}$ = Think: 14 can be divided by 7 but 8 cannot. 8 can be divided by 4 but 14 cannot. Both 14 and 8 can be divided by 2.

Divide the numerator and the denominator by 2.

$\frac{8}{14} = \frac{8 \div 2}{14 \div 2} = \frac{4}{7}$

A fraction is in simplest terms when 1 is the only number that divides both the numerator and the denominator evenly.

The fraction $\frac{4}{7}$ is in simplest terms.

PRACTICE

Simplify.

	a	*b*	*c*	*d*
1.	$\frac{9}{21} = \frac{9\div3}{21\div3} = \frac{3}{7}$	$\frac{2\div2}{10\div2} = \frac{1}{5}$	$\frac{4\div4}{12\div4} = \frac{1}{3}$	$\frac{12\div6}{18\div6} = \frac{2}{3}$
2.	$\frac{4\div2}{6\div2} = \frac{2}{3}$	$\frac{2\div2}{8\div2} = \frac{1}{4}$	$\frac{8\div4}{20\div4} = \frac{2}{5}$	$\frac{10\div2}{12\div2} = \frac{5}{6}$
3.	$\frac{45\div45}{45\div45} = 1$	$\frac{9\div3}{15\div3} = \frac{3}{5}$	$\frac{2\div2}{12\div2} = \frac{1}{6}$	$\frac{6\div2}{14\div2} = \frac{3}{7}$
4.	$\frac{9\div3}{12\div3} = \frac{3}{4}$	$\frac{3\div3}{9\div3} = \frac{1}{3}$	$\frac{10\div10}{20\div10} = \frac{1}{2}$	$\frac{6\div2}{8\div2} = \frac{3}{4}$
5.	$\frac{10\div5}{25\div5} = \frac{2}{5}$	$\frac{8\div2}{10\div2} = \frac{4}{5}$	$\frac{14\div2}{16\div2} = \frac{7}{8}$	$\frac{5\div5}{15\div5} = \frac{1}{3}$
6.	$\frac{9\div3}{21\div3} = \frac{3}{7}$	$\frac{2\div2}{20\div2} = \frac{1}{10}$	$\frac{4\div4}{36\div4} = \frac{1}{9}$	$\frac{12\div12}{24\div12} = \frac{1}{2}$