

Hands On: Model the Distributive Property

CA Standards
AF 1.3, MR 2.3

Use the Distributive Property to multiply 3×13 .

Step 1 Draw a rectangle that is 3 units wide and 13 units long.



Step 2 Divide the rectangle into two parts.

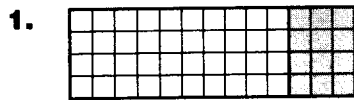


$$3 \times 13 = 3 \times (10 + 3)$$

Step 3 Use the Distributive Property to find the number of squares in each of the two sections of the rectangle. Then add the partial products.

$$\begin{aligned} (3 \times 10) + (3 \times 3) \\ 30 + 9 \\ 39 \end{aligned}$$

Use the Distributive Property to multiply. Show the partial products for each and find the sum. Then write a multiplication sentence for each.





Spiral Review

(Chapter 2, Lesson 3) KEY NS 2.3

Simplify.

3. $\frac{4}{10}$ _____

4. $\frac{10}{45}$ _____

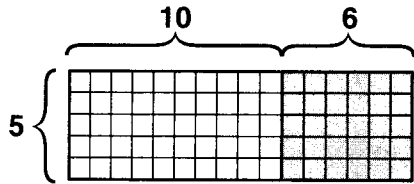
5. Mrs. Smith has 8 cupcakes. Six of her cupcakes have frosting. Mrs. Smith wants to represent her cupcakes as a fraction, but $\frac{6}{8}$ is too big. Simplify $\frac{6}{8}$.

Hands On: Model the Distributive Property

CA Standards
AF 1.3, MR 2.3

Use rectangles and the Distributive Property to solve problems 1–6.

1. A marching band has 16 rows with 5 band members in each row. How many band members are there in all?



$$5 \times 16 = (5 \times 10) + (5 \times 6)$$

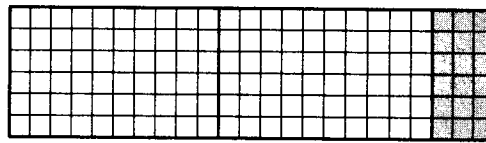
$$= \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}} \text{ band members}$$

3. There are 4 singers in each of 19 choirs performing at a competition. How many singers are there in all?

5. Ken deposits \$45 each week at his bank. How much has Ken deposited after 3 weeks?

2. In the Faber School cafeteria, there are 23 students sitting at 6 tables. How many students are at the tables in all?



4. At a model car show, there are 34 model cars in each of the 6 displays. How many model cars are there in all?

6. There are 114 students in each of the 4 grades in Lincoln High School. How many students are there in Lincoln High School?

Use the Distributive Property

CA Standards
AF 1.3, MR 1.1

Two Ways to Use the Distributive Property to Multiply	
Way 1 $a(b + c) = 6 \times (14 + 18)$ $= 6 \times 32$ $= 192$	Way 2 $(a \times b) + (a \times c) = (6 \times 14) + (6 \times 18)$ $= 84 + 108$ $= 192$

Use the Distributive Property to find the value of the variable.

1. $3 \times 66 = (j \times 60) + (3 \times 6)$

2. $8 \times 15 = (8 \times 10) + (8 \times m)$

3. $y \times 38 = (9 \times 30) + (9 \times 8)$

4. $4 \times 89 = (4 \times b) + (4 \times 34)$

5. $6 \times k = (6 \times 42) + (6 \times 12)$

6. $7 \times 28 = (7 \times 14) + (h \times 14)$

7. $c \times 42 = (8 \times 21) + (8 \times 21)$

8. $7 \times 73 = (7 \times b) + (7 \times 18)$

Spiral Review

(Chapter 2, Lesson 3) KEY NS 2.3

Simplify.

9. $\frac{16}{40}$ _____

10. $\frac{12}{15}$ _____

11. Jen has 45 flowers in a garden. Twenty of the flowers are red. Jen wants to represent this number as a fraction, but $\frac{20}{45}$ is too big. Simplify $\frac{20}{45}$ for Jen.
- _____

Use the Distributive Property

CA Standards
KEY AF 1.3, MR 1.1

Use the Distributive Property to solve problems 1–6.

1. Deb puts 7 flowers in one vase and 8 flowers in another vase. Steve puts 6 times the number of Deb's flowers in vases. How many flowers did Steve put into vases? Write two expressions. Then use the expressions to find the answer.

$$1: 6 \times (8 + 7) = 6 \times \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}}$$

$$2: (6 \times 7) + (6 \times 8) = \underline{\hspace{2cm}} + 48$$

$$= \underline{\hspace{2cm}}$$

3. Joanne sings for 23 minutes. Cheryl sings for 15 minutes. Gina sings for 2 times as many minutes as Joanne and Cheryl together. How many minutes does Gina sing?

5. There are 11 students in the art club, 10 students in the math club, and 12 students in the computer club. There are twice as many students in band as in the art club, math club, and computer clubs put together. Write an equation to find how many students are in band.

2. Johnny has 12 red buttons and 14 blue buttons. He has 3 times as many marbles as buttons. How many marbles does Johnny have? Write an equation to find out.

$$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} + \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}} \text{ marbles}$$

4. Tom has 5 shelves in his book case. Each shelf has 21 chapter books and 31 picture books. How many books are on Tom's shelves in all?

6. Paula saw 6 yellow birds and x blue birds while bird watching. James saw twice as many birds as Paula did. James saw 26 birds. Write an equation to find how many blue birds Paula saw while bird watching.

Properties of Addition

CA Standards
KEY AF 1.2, MR 1.1

Addition Properties		
Commutative Property	$a + b = b + a$	$7 + 8 = 8 + 7$
Associative Property	$a + (b + c) = (a + b) + c$	$11 + (6 + 8) = (11 + 6) + 8$
Identity Property	$a + 0 = a$	$9 + 0 = 9$
	$0 + a = a$	$0 + 9 = 9$

Evaluate. Identify the property or properties you used.

1. $98 + 0$

2. $44 + 23 + 17$

3. $78 + 23 + b$, given $b = 12$

4. $71 + (45 + h)$, given $h = 9$

Use $>$, $<$, or $=$ to make each statement true.

5. $59 + r$ $50 + 9 + r$

6. $(39 + 5) + 16$ $39 + (16 + 5)$

7. $41 + s + 45$ $41 + 54 + s$

8. $42 + j + 28$ $28 + j$

Spiral Review

(Chapter 3, Lesson 3) NS 1.0

Write the value of the underlined digit.

9. 488.893

10. 56.901

11. 790.3498

12. 56,008,009

Properties of Addition

CA Standards
KEY AF 1.2, MR 1.1

Use properties to solve problems 1-6.

1. Julie and her friends bought tickets for rides at the fair. Julie bought 24 tickets. Dottie bought 29 tickets, and Carlos bought 36 tickets. How many tickets did they buy in all?

$$24 + 29 + 36 = 24 + \underline{\hspace{2cm}} + 29$$

$$= \underline{\hspace{2cm}} + 29$$

$$= \underline{\hspace{2cm}} \text{ tickets}$$

3. Craig and his brothers were playing a game. Craig's score was 41 points. Jake's score was 23 points. Noah's score was 19 points more than his brothers' scores combined. How many points did Noah score?

5. Ginny played a game five times. She earned 57, 38, 75, 62, and 43 points. How many points did Ginny earn in all?

2. Stephen is preparing for his school's ice cream social. Stephen set 13 bowls on one table and 15 bowls on another table. He set 12 more bowls on a third table than on the first two combined. How many bowls did Stephen set on the third table?

$$(13 + 15) + 12 = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}} \text{ bowls}$$

4. Tom's class donates 47 cans of food to the local food pantry. Maria's class donates 32 cans of food. Jack's class donates 53 cans of food. How many cans of food were donated by the classes in all?

6. Barry raked leaves Monday through Wednesday. He earned \$12.25 on Monday and \$7.45 on Tuesday. For the week, he earned \$34.05. How much money did Barry earn on Wednesday?



Properties of Multiplication

CA Standard
(KEY) AF 1.2

Properties of Multiplication		
Commutative Property	$a \times b = b \times a$	$6 \times 7 = 7 \times 6$
Associative Property	$a \times (b \times c) = (a \times b) \times c$	$2 \times (3 \times 5) = (2 \times 3) \times 5$
Identity Property	$a \times 1 = a$	$8 \times 1 = 8$
Zero Property	$a \times 0 = 0$	$4 \times 0 = 0$

Use properties to complete. Identify each property.

1. $5 \times (20 \times 12) = \square \times 12$ 2. $35 \times 6 \times 0 = \square$ 3. $25 \times 7 \times 4 = 25 \times \square \times 7$

Evaluate each expression, given $a = 6$, $b = 3$, and $c = 5$.

4. $a \times (b \times c)$ _____ 5. $(a \times b) \times (c \times 0)$ _____

Compare. Write $>$, $<$, or $=$ for each.

6. $(68 \times 2) \times 16$ \bigcirc 68×16 7. $56 \times (8 \times 99)$ \bigcirc $(56 \times 99) \times 8$

Spiral Review (Chapter 5, Lesson 3) **KEY AF 1.2**

Evaluate each expression for $y = 4$.

8. $(16 \div y) + 15$ 9. $4 + (y + 10)$ 10. $(5 \times 4) - (y \times 4)$ 11. $(20 - y) + (3 \times 4)$

Properties of Multiplication

CA Standard
(KEY) AF 1.2

Use rectangles and the Distributive Property to solve problems 1-6.

1. Rob had 5 coins in his coin collection before he went to two coin shows. After the first coin show, Rob had 7 times the amount of coins he had before the show. After the second coin show, Rob had 2 times the number of coins he had after the first show. How many coins did Rob have after the second coin show?

$$5 \times 7 \times 2 = 5 \times \underline{\hspace{2cm}} \times 7$$

$$= \underline{\hspace{2cm}} \times 7$$

$$= \underline{\hspace{2cm}} \text{ coins}$$

3. The third grade planted 4 trees on Arbor Day. The fourth grade planted 7 times the number of trees as the third grade planted. The fifth grade planted 5 times the number of trees as the fourth grade. How many trees did the fifth grade plant?

5. Maria had saved \$4.00. Her mother gave her 2 times that amount to buy gifts for her sisters. In order to triple the total amount of money she had, Maria shoveled snow and did other chores. How much money does Maria have in all?

2. Mary has 25 blue beads. She has 3 times as many red beads as blue beads. She has 4 times as many yellow beads as red beads. How many yellow beads does Mary have?

$$(3 \times 25) \times 4 = \underline{\hspace{2cm}} \times (\underline{\hspace{2cm}} \times \underline{\hspace{2cm}})$$

$$= \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$$

$$= \underline{\hspace{2cm}} \text{ yellow beads}$$

4. Cans of pineapple juice come in packs of 6 cans. Packs of pineapple juice are placed in cartons with 4 packs in each carton. Cartons are placed in boxes with 50 cartons in each box. How many cans of pineapple juice are in 1 box?



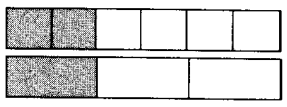
6. Benny made bundles of 5 candles. He put the bundles in bags with 7 bundles in each bag. He placed the bags in crates with 6 bags in each crate. Then he packed boxes with 8 crates in each box. How many candles were in each box?






Hands On: Add and Subtract Fractions with Like Denominators

CA Standards
NS 2.3, MR 3.2

Add $\frac{1}{6} + \frac{1}{6}$.

<p>Step 1</p> <p>Add $\frac{1}{6} + \frac{1}{6}$</p>  <p>Solution: $\frac{1}{6} + \frac{1}{6} = \frac{1}{3}$</p>	<p>Step 2</p> <p>Solve $\frac{1}{6} + \frac{1}{6} = \frac{2}{6}$</p> 	<p>Step 3</p> <p>Simplify $\frac{2}{6} = \frac{1}{3}$</p> 
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Subtract $\frac{3}{4} - \frac{1}{4}$.

<p>Step 1</p> <p>Subtract $\frac{3}{4} - \frac{1}{4}$</p>  <p>Solution: $\frac{3}{4} - \frac{1}{4} = \frac{1}{2}$</p>	<p>Step 2</p> <p>Solve $\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$</p> 	<p>Step 3</p> <p>Simplify $\frac{2}{4} = \frac{1}{2}$</p> 
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Find each sum or difference. Write each answer in simplest form.

- | | | | |
|--------------------------------------|--|--|--|
| 1. $\frac{3}{8} - \frac{1}{8}$ _____ | 2. $\frac{7}{10} - \frac{1}{10}$ _____ | 3. $\frac{1}{4} + \frac{2}{4}$ _____ | 4. $\frac{4}{12} + \frac{2}{12}$ _____ |
| 5. $\frac{4}{5} - \frac{1}{5}$ _____ | 6. $\frac{3}{8} + \frac{1}{8}$ _____ | 7. $\frac{3}{10} + \frac{5}{10}$ _____ | 8. $\frac{5}{6} - \frac{3}{6}$ _____ |

Spiral Review (Chapter 5, Lesson 3) **KEY AF 1.2**

Evaluate each expression when $t = 5$.

9. $14 + t$ _____
10. $t - 1$ _____
11. Linda has a collection of dolls (t). She adds 2 more dolls to the collection. How many dolls does Linda now have? _____

Name _____ Date _____

Hands On: Add and Subtract Fractions with Like Denominators

CA Standards
(KEY) NS 2.3, MR 3.2

Solve problems 1–6.

1. Jamal's mom bought a gallon of ice cream on Monday. That night the family ate $\frac{2}{6}$ of it. The next day, someone ate another $\frac{1}{6}$. How much of the ice cream was eaten?



3. The baseball team washed cars to raise money for new uniforms. They tallied the kinds of cars they washed. Here are the day's results: $\frac{3}{8}$ of the cars were compact, $\frac{4}{8}$ were SUV's and $\frac{1}{8}$ mini-vans. How many more of the cars were compact than mini-vans?

5. A school is working hard to get a recycling program going. The surrounding community is helping by combining their recycling with the school's recycling. One day, there was $\frac{1}{12}$ flattened boxes, $\frac{2}{12}$ newspaper, $\frac{4}{12}$ used copy paper, $\frac{2}{12}$ cans and $\frac{1}{12}$ bottles. How much of the recycling was paper products?

2. Kendra had $\frac{6}{8}$ of a box of popsicles to share with friends after school. They ate $\frac{4}{8}$ of the box. How much of a box of popsicles do they have now?



4. Softball try-outs were held on Saturday. $\frac{3}{10}$ of the players who came wanted to pitch, $\frac{5}{10}$ hoped to be in the infield or outfield, and $\frac{2}{10}$ looked forward to being the catcher. What fraction of the players wanted to be the pitcher or catcher?

6. The Environmental Club at a school has decided to plant bulbs, bushes and trees in the spring. Each hallway has a flatbed for donated plants or bulbs. Hallway A has $\frac{1}{10}$ bulbs, $\frac{2}{10}$ small bushes and $\frac{7}{10}$ tree seedlings. Hallway B has $\frac{2}{10}$ bulbs, $\frac{1}{10}$ small bushes and $\frac{7}{10}$ tree seedlings. How many flatbeds of tree seedlings are there?

Add and Subtract Fractions with Like Denominators

CA Standards
KEY NS 2.3, MR 1.1

Add $\frac{7}{14} + \frac{3}{14}$.

Step 1

$$\text{Add } \frac{7}{14} + \frac{3}{14} = \frac{10}{14}$$

$$\text{Solution: } \frac{7}{14} + \frac{3}{14} = \frac{5}{7}$$

Step 2

$$\text{Simplify } \frac{7}{14} + \frac{3}{14} = \frac{10}{14} = \frac{5}{7}$$

Subtract $\frac{11}{12} - \frac{5}{12}$.

Step 1

$$\text{Subtract } \frac{11}{12} - \frac{5}{12} = \frac{6}{12}$$

$$\text{Solution: } \frac{11}{12} - \frac{5}{12} = \frac{1}{2}$$

Step 2

$$\text{Simplify } \frac{11}{12} - \frac{5}{12} = \frac{6}{12} = \frac{1}{2}$$

Add or subtract. Write each answer in simplest form.

1. $\frac{3}{8} + \frac{3}{8}$ _____

2. $\frac{9}{10} - \frac{3}{10}$ _____

3. $\frac{3}{8} + \frac{1}{8}$ _____

4. $\frac{8}{15} - \frac{3}{15}$ _____

5. $\frac{5}{6} + \frac{1}{6}$ _____

6. $\frac{7}{8} - \frac{5}{8}$ _____

7. $\frac{4}{7} - \frac{2}{7}$ _____

8. $\frac{9}{16} + \frac{1}{16}$ _____

Spiral Review

(Chapter 5, Lesson 3) KEY AF 1.2, AF 1.0

Evaluate each expression when $n = 6$.

9. $12 - n$ _____

10. $n + 9$ _____

11. Juan had a bag of 12 candies. He lost some of them while riding home on his bike. Write the expression for the number of candies he has now. _____

Add and Subtract Fractions with Like Denominators

CA Standards
KEY NS 2.3, MR 1.1

Solve. Write each answer in simplest form.

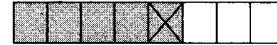
1. Megan filled $\frac{3}{9}$ of a fruit basket with red delicious apples and $\frac{3}{9}$ with Bartlett pears. How much of the basket is apples and pears?



3. $\frac{9}{16}$ of the United States' citrus crop grows in the state of Florida and $\frac{5}{16}$ in California. How much more of the country's citrus fruits comes from Florida?

5. If Florida's citrus crop is $\frac{5}{12}$ oranges, $\frac{3}{12}$ grapefruit, $\frac{2}{12}$ lemons and the rest tangerines, how much of the crop is tangerines?

2. Machito had $\frac{5}{8}$ of a box of oranges and ate $\frac{1}{8}$ of the box. What part of the box of oranges is left?



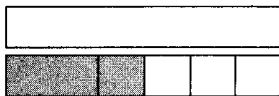
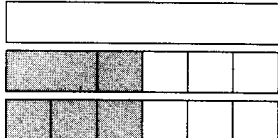
4. $\frac{5}{12}$ of Florida's citrus crop is oranges. $\frac{3}{12}$ of the citrus crop is grapefruit. How much of the state's citrus crop is oranges and grapefruit?

6. Suppose two trucks containing $\frac{5}{6}$ each of California navel oranges, come in to a distribution center. How many truckloads of California navel oranges are waiting to go out to grocery stores?

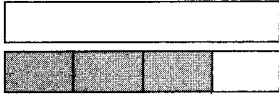
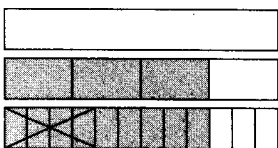
Hands On: Add and Subtract Fractions with Unlike Denominators

CA Standards
KEY NS 2.3, MR 3.2

Add $\frac{1}{3} + \frac{1}{6}$.

<p>Step 1</p> <p>Add $\frac{1}{3} + \frac{1}{6}$</p>  <p>Solution: $\frac{1}{3} + \frac{1}{6} = \frac{3}{6}$</p>	<p>Step 2</p> <p>Make a row of tiles the same length, but use like tiles. $\frac{1}{3} + \frac{1}{6} = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{3}{6}$</p> 
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Subtract $\frac{3}{4} - \frac{1}{3}$.

<p>Step 1</p> <p>Subtract $\frac{3}{4} - \frac{1}{3}$</p>  <p>Solution: $\frac{3}{4} - \frac{1}{3} = \frac{5}{12}$</p>	<p>Step 2</p> <p>Find fraction tiles with like units that fit in the space and show the difference between $\frac{3}{4}$ and $\frac{1}{3}$. Do $\frac{1}{12}$ tiles work?</p> <p>$\frac{3}{4} - \frac{1}{3} = \frac{9}{12} - \frac{4}{12} = \frac{5}{12}$</p> 
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Find each sum or difference.

1. $\frac{3}{12} - \frac{1}{6}$ _____ 2. $\frac{3}{5} - \frac{2}{10}$ _____ 3. $\frac{1}{4} + \frac{2}{8}$ _____ 4. $\frac{2}{6} + \frac{6}{12}$ _____

Spiral Review (Chapter 4, Lesson 1) **KEY NS 1.5**

Write each fraction or mixed number in decimal form.

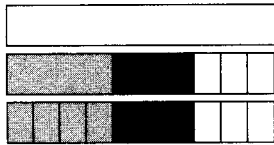
5. $1\frac{1}{5}$ _____ 6. $3\frac{3}{4}$ _____
7. Brandon is working hard to increase his speed while running a mile. He hopes to be able to run that distance in $4\frac{1}{4}$ minutes by next year. He jots this goal into his practice log as a decimal. What did he write? _____

Hands On: Add and Subtract Fractions with Unlike Denominators

CA Standards
KEY NS 2.3, MR 3.2

Solve problems 1–6.

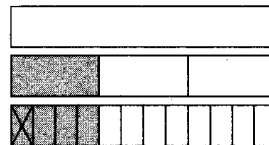
1. The Jones family is leaving on vacation. They fill $\frac{2}{5}$ of their van's cargo space with the children's luggage and $\frac{3}{10}$ with their parents' suitcases. How much of the cargo space is filled?



3. The Jones family will be traveling cross country. During the early morning rush, they travel $\frac{1}{10}$ of the distance planned for the day. By lunch time they have gone another $\frac{2}{5}$ of the way. How far has the family traveled?

5. The family reaches a state park and stops to hike. The Red Trail is $\frac{1}{2}$ mile long. The Blue Trail is $\frac{2}{3}$ of a mile. The Yellow Trail is $\frac{5}{12}$ of a mile. What is the total distance of the park's three trails?

2. The family rearranges their bags so that $\frac{1}{3}$ of the space is free. Then they use $\frac{1}{12}$ of the space for a forgotten bag. How much free space is there now?



4. The family stops for lunch and gets a $\frac{1}{2}$ bucket of chicken and some salad. By the time they finish, there is only $\frac{1}{8}$ of the bucket left. How much of the bucket did they eat?

6. They read about a new trail which is being constructed. It will be the park's longest at $1\frac{1}{2}$ miles. How much longer than the Blue Trail will it be?

Add and Subtract Fractions with Unlike Denominators

CA Standard
KEY NS 2.3

 Add $\frac{1}{3} + \frac{1}{4}$.

Step 1

 Find a common denominator. Since 4 is not a multiple of 3, multiply 3×4 . 12 is the common denominator.

Solution: $\frac{1}{3} + \frac{1}{4} = \frac{7}{12}$

Step 2

Rewrite the problem. Then add. Write the answer in simplest form.

$$\frac{1}{3} = \frac{4}{12}$$

$$\frac{1}{4} = \frac{3}{12}$$

$$\frac{4}{12} + \frac{3}{12} = \frac{7}{12}$$

 Subtract $\frac{2}{3} - \frac{1}{6}$.

Step 1

Find a common denominator. Since 6 is a multiple of 3, you can use 6 as the common denominator.

Solution: $\frac{2}{3} - \frac{1}{6} = \frac{1}{2}$

Step 2

Rewrite the problem. Then subtract. Write the answer in simplest form.

$$\frac{2}{3} = \frac{4}{6}$$

$$\frac{4}{6} - \frac{1}{6} = \frac{3}{6} = \frac{1}{2}$$

Add or subtract. Write each answer in simplest form.

1. $\frac{3}{4} - \frac{1}{3}$ _____

2. $\frac{7}{10} - \frac{1}{4}$ _____

3. $\frac{1}{3} + \frac{2}{4}$ _____

4. $\frac{4}{10} + \frac{1}{3}$ _____

5. $\frac{2}{3} - \frac{1}{5}$ _____

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

7. $\frac{3}{10} + \frac{9}{20}$ _____

8. $\frac{5}{8} - \frac{1}{4}$ _____

Spiral Review

 (Chapter 4, Lesson 1) **KEY NS 1.5, MR 2.3**

Write each fraction in decimal form.

9. $\frac{3}{4}$ _____

10. $\frac{1}{5}$ _____

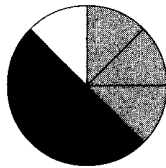
11. A soccer team was able to complete
- $\frac{7}{10}$
- of their drills during a two-hour practice session. They must fill out a log sheet reporting the portion of exercises not finished in decimal form. _____

Add and Subtract Fractions with Unlike Denominators

CA Standard
(KEY) NS 2.3

Solve problems 1–6.

1. Sameena filled $\frac{3}{8}$ of a pizza with mushrooms and $\frac{1}{2}$ with onions. How much of the pizza is covered with vegetables?



3. Kady made a pizza that was $\frac{3}{10}$ pineapple and $\frac{1}{2}$ ham. The rest was plain. How much of Kady's pizza is plain?

5. A pizza shop bought a bushel of fresh vegetables. $\frac{4}{15}$ of the bushel was used on Friday, $\frac{3}{5}$ on Saturday and $\frac{2}{15}$ on Sunday. How much of the bushel is left for Monday?

2. Dondre' bought $\frac{3}{4}$ of a pound of ground beef for cheeseburger pizza. He used $\frac{2}{3}$ of a pound to make it. How much meat is left?



4. Yon Sue made her pizza with $\frac{5}{8}$ cup chopped broccoli and $\frac{3}{16}$ cup green pepper. How much more of the pizza has broccoli on it than green pepper?

6. A pizza shop took a poll of favorite toppings over a month's time. $\frac{1}{4}$ of the customers' votes were for pepperoni, $\frac{7}{16}$ for sausage, $\frac{3}{16}$ for peppers and $\frac{1}{8}$ for mushrooms. How many more of the customers' votes were for meat than for vegetables?



Problem Solving: Work Backward

CA Standards
MR 2.6, (13) NS 2.3

Use the Word Backward strategy to solve. Explain why your answer makes sense.

Chloe had a certain amount of fruit juice set aside for a party. She had $\frac{1}{5}$ gallon less orange juice than the entire amount of fruit juice. She had $\frac{3}{4}$ gallon less apple juice than orange juice. She had $\frac{1}{4}$ gallon more grape juice than apple juice. If she had $\frac{2}{5}$ gallon grape juice, how much fruit juice did she have?

Grape Juice		Apple Juice		Orange Juice		Fruit Juice
$\frac{2}{5}$ gallon	$-\frac{1}{4}$	$\frac{3}{20}$ gallon	$+\frac{3}{4}$	$\frac{18}{20}$ gallon	$+\frac{1}{5}$	$\frac{22}{20}$
This is $\frac{1}{4}$ gallon more than apple juice.	Work backward. Subtract $\frac{1}{4}$. $\frac{2}{5} - \frac{1}{4}$ $= \frac{8}{20} - \frac{5}{20}$ $= \frac{3}{20}$	This is $\frac{3}{4}$ gallon less than orange juice.	Work backward. Add $\frac{3}{4}$. $\frac{3}{20} + \frac{3}{4}$ $= \frac{3}{20} + \frac{15}{20}$ $= \frac{18}{20}$	This is $\frac{1}{5}$ gallon less than the total amount of fruit juice.	Work backward. Add $\frac{1}{5}$. $\frac{18}{20} + \frac{1}{5}$ $= \frac{18}{20} + \frac{4}{20}$ $= \frac{22}{20}$	

Solution: Chloe had $\frac{22}{20}$ gallon or $1\frac{1}{10}$ gallon of fruit juice.

- Calvin spent a certain amount of time doing chores around the house. He spent $\frac{1}{2}$ hour more cleaning his room than washing the dishes. He spent $\frac{1}{4}$ hour more washing the dishes than taking out the trash. He spent $\frac{1}{6}$ hour taking out the trash. How much time did Calvin spend cleaning his room?

Spiral Review

(Chapter 4, Lesson 2) MR 2.3

Write each fraction or mixed number as a decimal.

2. $2\frac{3}{4}$ _____

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

- Jonas drank $\frac{7}{8}$ of a glass of milk. What is $\frac{7}{8}$ written as a decimal? Round to the nearest hundredth.

Problem Solving: Work Backward

CA Standards
MR 2.6, KEY NS 2.3

Use the **Work Backward** strategy to solve. Explain why your answer makes sense.

1. Anna and Kirby went running together on Saturday and Sunday. Kirby ran $\frac{1}{3}$ mile more than Anna on Saturday. Kirby ran a total of 3 miles on Saturday. How many miles did Anna run?

$$3 - \frac{1}{3} = \underline{\hspace{2cm}}$$

3. Greg's family went on vacation and kept track of the amount of gasoline they used over the 3 days. On the second day, they used $\frac{3}{5}$ of a tank more than on the first day. On the third day, they used $\frac{1}{3}$ of a tank less than on the second day. They used $\frac{4}{5}$ of a tank on the third day. How much gas did they use on the first day?

5. Mariah's class collected soup labels to raise money for their school. Each day they placed the collected labels in a jar to see how much they collected that day. They kept track of how much they collected over a week. On Tuesday, they collected $\frac{1}{8}$ jar more than on Monday. On Wednesday, they collected $\frac{1}{2}$ jar more than on Tuesday. On Thursday, they collected $\frac{1}{4}$ jar less than on Wednesday. On Friday, they collected $\frac{3}{8}$ more than on Thursday. On Friday, $\frac{3}{4}$ of the jar was filled with soup labels. How much of a jar did they collect on Monday?

2. Angela made a side salad for dinner. She put in $\frac{3}{4}$ cup more lettuce than tomato in the salad. She put $\frac{1}{4}$ cup more cucumber than tomato in the salad. She put $\frac{1}{2}$ cup cucumber in the salad. How much lettuce did Angela put in her salad?

$$\frac{1}{2} - \frac{1}{4} = \underline{\hspace{2cm}}$$

$$\underline{\hspace{2cm}} + \frac{3}{4} = \underline{\hspace{2cm}}$$

4. Tim bought a certain amount of green paint for a picture he was painting. He bought $\frac{3}{4}$ pint more yellow than green paint. He bought $\frac{5}{8}$ pint less blue paint than yellow paint. If he bought $\frac{1}{4}$ pint of blue paint, how much green paint did Tim buy?

6. Susan knit a blanket for her niece. Susan put $\frac{1}{3}$ more pink yarn than purple yarn in the blanket. There is $\frac{5}{9}$ less purple yarn than white yarn. The blanket is $\frac{3}{4}$ white yarn. How much of the blanket is pink yarn?

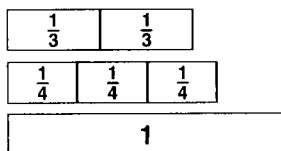
Name _____ Date _____

Hands On: Sums Greater Than 1

CA Standards
(KEY) NS 2.3, MR 2.3

Use Fraction Tiles to Add $\frac{2}{3} + \frac{3}{4}$.

Step 1 Place two $\frac{1}{3}$ tiles and three $\frac{1}{4}$ tiles under one whole bar.

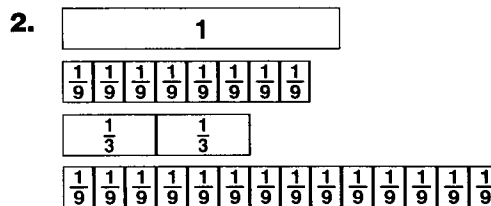
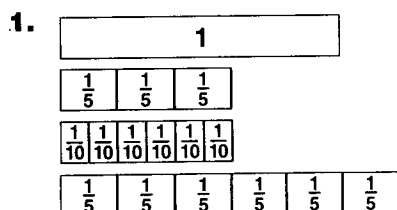


Step 2 Find like fraction tiles that make a row the same length as the sum of $\frac{2}{3}$ and $\frac{3}{4}$.

Step 3 Add, writing the sum as a mixed number in simplest form:

$$\frac{2}{3} + \frac{3}{4} = \frac{17}{12} = 1\frac{5}{12}$$

Write the equation illustrated by the model. Write the sum as a mixed number in simplest form.



Add. Write each sum as a mixed number in simplest form.

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

4. $\frac{1}{4} + \frac{7}{8}$ _____

5. $\frac{3}{4} + \frac{1}{2}$ _____

6. $\frac{3}{4} + \frac{2}{5}$ _____

Spiral Review (Chapter 5, Lesson 5) **KEY** AF 1.5, AF 1.0

7. Complete the function table to find the value of y .

Week x	1	2	3	4	5	6	7
Allowance saved (dollars) y	\$4	\$8	\$12				

8. Write an equation for the function table. _____



Name _____ Date _____

Hands On: Sums Greater Than 1

CA Standards
KEY NS 2.3, MR 2.3

Solve Problems 1–6.

1. Sally and Tyrell each have $\frac{2}{3}$ of a cup of lemonade. How much do they have all together? Write your answer as a mixed number.

1

$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$
---------------	---------------	---------------	---------------

3. Jerice has $\frac{2}{3}$ of a pound of cherries. Andy has $\frac{5}{6}$ of a pound of cherries. How much will they have if they combine their cherries? Write your answer in simplest form.

5. Chad is making salsa for a party. The recipe calls for $\frac{5}{6}$ of a cup of tomatoes, $\frac{3}{4}$ of a cup of onions, and $\frac{1}{2}$ of a cup of cilantro. What is the total amount of ingredients needed to make salsa? Write a number sentence to show your answer.

2. Jackson and Chase are having lunch. Jackson eats $\frac{7}{16}$ of a pizza, and Chase eats $\frac{5}{8}$ of a pizza. How much pizza have Jackson and Chase eaten?

4. Kevin walks $\frac{7}{8}$ of a mile from Elm Street to Oak Street. Maple Street is $\frac{3}{4}$ of a mile south of Oak Street. If he continues to Maple Street, how far will Kevin have walked?

6. Mark's recipe for burritos calls for $\frac{2}{3}$ cup of Monterey Jack cheese and $\frac{1}{4}$ cup of Cheddar cheese. The recipe makes 4 burritos. Mark is expecting 8 people for dinner. Half of them will each eat one burrito, and the others will each eat two. What is the total amount of cheese that Mark will need? Write your answer in simplest terms.

Add a Fraction and a Mixed Number

CA Standards
KEY NS 2.3, MR 2.4

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

Step 1 Find a common denominator for the fractions. Multiply the denominators.

$$2 \times 5 = 10$$

Step 3 Add the fractions.

$$\frac{5}{10} + \frac{6}{10} = \frac{11}{10}$$

There is only one whole number: 1

$$1 + \frac{11}{10} = 1\frac{11}{10}$$

Solution: $1\frac{1}{2} + \frac{3}{5} = 2\frac{1}{10}$

Step 2 Rewrite the fractions using the common denominator.

$$\frac{1}{2} = \frac{5}{10}$$

$$\frac{3}{5} = \frac{6}{10}$$

Step 4 Simplify the sum if possible.

$$1\frac{11}{10} = 2\frac{1}{10}$$

Add. Write each sum in the simplest form.

1. $8\frac{1}{2} + \frac{2}{3} =$ _____

2. $2\frac{3}{7} + \frac{6}{7} =$ _____

3. $8\frac{1}{6} + \frac{1}{2} =$ _____

4. $\frac{5}{7} + 4\frac{1}{2} =$ _____

Spiral Review

(Chapter 5, Lesson 5) **KEY AF 1.5, AF 1.0**

5. Complete the function table to find the value of y .

Day x	1	2	3	4	5	6	7
Amount collected (pennies) y	15	30	45				

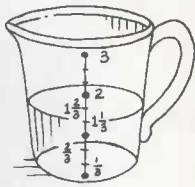
6. Write an equation for the function table. _____

Add a Fraction and a Mixed Number

CA Standards
KEY NS 2.3, MR 2.4

Solve Problems 1–6.

1. Andrea is measuring water for a science experiment. She already has $1\frac{1}{3}$ cups of water in her measuring beaker, and then adds another $\frac{2}{3}$ cup of water. How much water does she have in all?



3. Beth is making a pie and has $2\frac{1}{3}$ cup of sugar. She realizes she needs $\frac{1}{6}$ cup more for the recipe. How much sugar does the recipe need in all?

5. Evelyn and Ferris are on the stage crew for the school play. They need to put tape on the stage to mark where the performers should stand. The director gave them this list. How much tape do they need in all?

*1 $\frac{3}{4}$ Feet : 2 pieces
 $\frac{2}{3}$ Foot : 6 pieces
 $\frac{5}{6}$ Foot : 4 pieces*

2. Halley is also measuring water. She has $1\frac{1}{2}$ cups and adds $\frac{1}{3}$ cup. How much water does she have in all? Hint: multiply 2×3 to find a common denominator, then add.

4. James is building a dollhouse for his little brother and sister. He has pieces of carpet $5\frac{3}{5}$ inches long and $4\frac{1}{3}$ inches long. Put end to end, are these two pieces long enough to cover a floor that is 10 inches long? Explain your answer.

6. Peter and Susan are making costumes for the school play. They went to the store to buy fabric for the animals' costumes. The two bears each need $4\frac{1}{4}$ yards of brown fabric. The rabbit needs $3\frac{2}{3}$ yards of brown fabric, and the squirrel needs $2\frac{3}{8}$ yards of brown fabric. How much brown fabric do Peter and Susan need?



Add Mixed Numbers with and without Regrouping

CA Standards
KEY NS 2.3, MR 2.4

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

Step 1 Use a common denominator to find equivalent fractions.

$$2\frac{5}{6} = 2\frac{10}{12}$$

$$3\frac{2}{3} = 3\frac{8}{12}$$

Step 2 Add the fractions.

$$\begin{array}{r} 2\frac{10}{12} \\ + 3\frac{8}{12} \\ \hline 5\frac{18}{12} \end{array}$$

Step 3 Add the whole numbers. Simplify.

$$\begin{array}{r} 2\frac{10}{12} \\ + 3\frac{8}{12} \\ \hline 5\frac{18}{12} = 6\frac{6}{12} = 6\frac{1}{2} \end{array}$$

Add. Write each sum in simplest form.

1. $3\frac{2}{3} + 1\frac{1}{4}$ _____

2. $4\frac{1}{2} + 2\frac{3}{8}$ _____

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

4. $1\frac{4}{5} + 2\frac{1}{2}$ _____

5. $6\frac{3}{5} + 4\frac{7}{10}$ _____

6. $5\frac{2}{3} + 1\frac{3}{4}$ _____

7. $9\frac{1}{2}$ _____

8. $5\frac{3}{8}$ _____

9. $1\frac{9}{10}$ _____

+ $4\frac{2}{3}$ _____

+ $1\frac{3}{4}$ _____

+ $7\frac{4}{5}$ _____

Evaluate the expression. Write your answer in simplest form.

10. Evaluate $1\frac{1}{3} + y$, if $y = 3\frac{5}{8}$. _____

11. Evaluate $3\frac{2}{5} + y$, if $y = 2\frac{1}{10}$. _____

Spiral Review

(Chapter 7, Lesson 1) KEY NS 2.3, MR 3.2

Solve.

12. $5 + \frac{1}{2}$ _____

13. $\frac{3}{5} + 4$ _____

14. Juanita has $\frac{2}{3}$ of a candy bar. Max gives her a whole candy bar. How many candy bars does Juanita have now?

Add Mixed Numbers with and without Regrouping

CA Standards
(KEY) NS 2.3, MR 2.4

Solve Problems 1–6.

1. Paulina used $4\frac{1}{2}$ yards of red cloth and $2\frac{1}{4}$ yards of blue cloth to make a costume. How much cloth did she use altogether? Hint: use 4 as the common denominator.

$$\frac{1}{2} = \frac{2}{4}$$

3. Denise also baked $2\frac{3}{5}$ trays of chocolate chip cookies and $1\frac{2}{7}$ trays of oatmeal raisin cookies. How many trays of chocolate chip and oatmeal raisin cookies did she bake in all?
-
5. Andrew and Becky do chores on the weekend to earn their allowance. Last weekend they each spent $2\frac{1}{2}$ hours doing laundry, $1\frac{5}{20}$ hours cleaning the house, and $1\frac{3}{4}$ hours raking leaves. How many hours did they each spend on chores last weekend? Write your answer in simplest form.
-

2. Denise baked $2\frac{1}{2}$ trays of sugar cookies and $1\frac{3}{4}$ trays of peanut butter cookies. How many trays of cookies did she bake in all? Express your answer in simplest form.
-

4. Felicia spent $3\frac{3}{4}$ hours completing her science project on Monday, and then $2\frac{2}{6}$ hours on Tuesday. How many hours in all did Felicia spend on her science project?
-

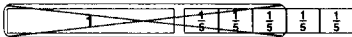
6. Andrew and Becky each earn \$3 an hour for doing chores. They are going to combine their allowances to buy a video game. How much money do Andrew and Becky have to spend on a video game?
-

Name _____ Date _____

Hands On: Rename to Subtract

CA Standards
KEY NS 2.3, NS 2.0

Use Fraction Tiles to model $2 - 1\frac{3}{5}$.

<p>Step 1 Use two whole fraction tiles to represent 2.</p> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid black; width: 40px; height: 15px; text-align: center; line-height: 15px;">1</div> <div style="border: 1px solid black; width: 40px; height: 15px; text-align: center; line-height: 15px;">1</div> </div>	<p>Step 2 Rename one whole tile as $\frac{5}{5}$ using five $\frac{1}{5}$ tiles.</p> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="border: 1px solid black; width: 40px; height: 15px; text-align: center; line-height: 15px;">1</div> <div style="display: flex; gap: 2px;"> <div style="border: 1px solid black; width: 10px; height: 15px; text-align: center; line-height: 15px;">$\frac{1}{5}$</div> <div style="border: 1px solid black; width: 10px; height: 15px; text-align: center; line-height: 15px;">$\frac{1}{5}$</div> <div style="border: 1px solid black; width: 10px; height: 15px; text-align: center; line-height: 15px;">$\frac{1}{5}$</div> <div style="border: 1px solid black; width: 10px; height: 15px; text-align: center; line-height: 15px;">$\frac{1}{5}$</div> <div style="border: 1px solid black; width: 10px; height: 15px; text-align: center; line-height: 15px;">$\frac{1}{5}$</div> </div> </div>	<p>Step 3 Subtract $1\frac{3}{5}$ by taking away one whole tile and 3 of the $\frac{1}{5}$ tiles. The remaining tiles show the difference.</p> <div style="text-align: center; margin-top: 10px;">  </div> <div style="margin-top: 10px;"> $1\frac{5}{5} - 1\frac{3}{5} = \frac{2}{5}$ <p style="text-align: center;">so $2 - 1\frac{3}{5} = \frac{2}{5}$</p> </div>
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Use fraction tiles to rename the whole number. Subtract the mixed number from the whole number. Sketch your model.

1. $3 - 1\frac{2}{3}$ _____

2. $3 - 1\frac{5}{6}$ _____

3. $4 - 2\frac{5}{9}$ _____

4. $3 - 1\frac{3}{8}$ _____

5. $4 - 1\frac{5}{7}$ _____

6. $2 - 1\frac{2}{5}$ _____

7. $2 - 1\frac{1}{6}$ _____

8. $3 - 2\frac{3}{10}$ _____

9. $4 - 2\frac{1}{5}$ _____

10. Sketch three different ways to show the number 6 as a mixed number.

Spiral Review

 (Chapter 4, Lesson 2) KEY NS 1.2

Write the decimal as a fraction or a mixed number.

11. 0.25 _____

12. 1.75 _____

13. 0.8 _____

14. 2.65 _____

15. 5.9 _____

Write the fraction as a decimal.

16. $\frac{1}{10}$ _____

17. $\frac{25}{100}$ _____

18. $\frac{2}{5}$ _____

19. $\frac{27}{100}$ _____

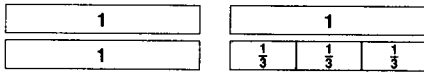
20. $\frac{6}{100}$ _____

Hands On: Rename to Subtract

CA Standards
KEY NS 2.3, NS 2.0

Use fraction tiles to rename the whole number for problems 1–6.

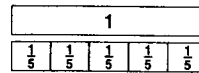
1. Pauline is subtracting $4 - 1\frac{2}{3}$. She made this model to rename 4 as $3\frac{3}{3}$. What should she write for an answer?



3. Mike and Amy were riding their bikes on a camp trail. Amy rode 3 miles, and Mike rode $2\frac{5}{8}$ miles. How much farther did Amy ride than Mike?

5. Erin brought 8 cookies to share with her friend Dianna, but gave the dog one cookie. Of the remaining cookies, Erin ate two cookies and Dianna ate $\frac{19}{7}$ cookies. How many cookies were left?

2. Sara has to subtract $2 - 1\frac{4}{5}$. How should she rename 2? What should she write for her answer?



4. Carolyn was jogging on a trail. She ran $2\frac{5}{12}$ miles of the 4 mile trail. How much further would she have had to jog to complete the 4 mile trail?

6. Alyce and Julie were sitting by the pool eating lunch. Alyce took out six sandwiches cut into quarters, but dropped one whole sandwich and three quarters into the pool. If Alyce and Julie split the remaining sandwiches equally, how many sandwiches would each one get?

Rename to Subtract

CA Standards
KEY NS 2.3, NS 2.0

Find $3 - 1\frac{3}{8}$.

Step 1 Rename 3 as $2 + 1$. Then rename 1 as a fraction, using 8 for the denominator. $3 = 2\frac{8}{8}$

Step 3 Subtract the whole numbers.
 $2 - 1 = 1$

Step 2 Subtract the fractions. $\frac{8}{8} - \frac{3}{8} = \frac{5}{8}$

Step 4 Use addition to check your work.
 $1\frac{5}{8} + 1\frac{3}{8} = 2\frac{8}{8} = 3$

Subtract. Check your answers.

1.
$$\begin{array}{r} 9 \\ - 7\frac{1}{14} \\ \hline \end{array}$$

2.
$$\begin{array}{r} 3 \\ - 1\frac{1}{3} \\ \hline \end{array}$$

3.
$$\begin{array}{r} 7 \\ - 2\frac{5}{8} \\ \hline \end{array}$$

4.
$$\begin{array}{r} 4 \\ - 1\frac{1}{4} \\ \hline \end{array}$$

5.
$$\begin{array}{r} 15 \\ - 8\frac{5}{6} \\ \hline \end{array}$$

6.
$$\begin{array}{r} 2 \\ - 1\frac{4}{5} \\ \hline \end{array}$$

7.
$$\begin{array}{r} 6 \\ - 5\frac{7}{18} \\ \hline \end{array}$$

8.
$$\begin{array}{r} 12 \\ - 9\frac{2}{3} \\ \hline \end{array}$$

9.
$$\begin{array}{r} 5 \\ - 4\frac{3}{25} \\ \hline \end{array}$$

10.
$$\begin{array}{r} 13 \\ - 6\frac{9}{14} \\ \hline \end{array}$$

11. $24 - 6\frac{6}{13}$

12. $8 - 2\frac{1}{3}$

13. $6 - 1\frac{3}{7}$

14. $18 - 15\frac{6}{7}$

15. $9 - 6\frac{14}{15}$

16. $12 - 3\frac{4}{5}$

17. $36 - 14\frac{4}{9}$

18. $19 - 4\frac{7}{18}$

Spiral Review (Chapter 4, Lesson 2) KEY NS 1.2

Write the decimal as a fraction or a mixed number.

19. 2.75 _____

20. 0.25 _____

21. 0.37 _____

22. 1.17 _____

23. 0.7 _____

Write the fraction as a decimal.

24. $\frac{3}{5}$ _____

25. $\frac{7}{10}$ _____

26. $\frac{49}{100}$ _____

27. $\frac{3}{4}$ _____

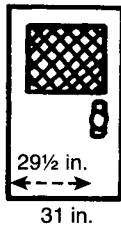
28. $\frac{1}{2}$ _____

Rename to Subtract

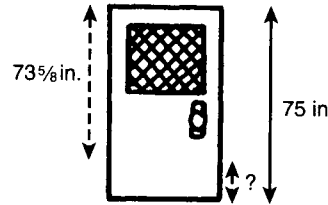
CA Standards
KEY NS 2.3, NS 2.0

Solve problems 1–6.

1. Bobby bought a new door that was 31 inches wide. He can't fit a door wider than $29\frac{1}{2}$ inches into his door frame, so he needs to trim the new door. How much does he have to cut off the width of the new door to make it fit?



2. Bobby's new door is also too tall. It is 75 inches tall, but the door frame will only hold a door up to $73\frac{5}{8}$ inches. How much does he have to cut off the height of the door to make it fit?



3. Anita must be 5 feet tall to ride the water slide at the park. She is $4\frac{1}{4}$ feet tall. How much taller does Anita need to be to ride the water slide?

5. Peter and Chu-nan read comic books for an hour. Chu-nan read two comic books, each 10 pages long. Peter read $8\frac{5}{6}$ pages each of two comic books. How many more pages did Chun-nan read than Peter?

4. George read 4 books this week. Last week, George read $2\frac{5}{9}$ books. How many more books did George read this week than last week?

6. John, Chip, Alex, and Gretchen went to the county fair. By the end of the day, John and Gretchen had each eaten 2 cups of ice cream and split a third one. Chip and Alex ate $4\frac{3}{4}$ cups of ice cream together. Who ate more ice cream: John and Gretchen or Chip and Alex? How much more did they eat?



Subtract Mixed Numbers with Like Denominators

CA Standards
KEY NS 2.3, NS 2.0

Find $3\frac{1}{5} - 1\frac{2}{5}$.

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

Step 2 Subtract the fractions. $\frac{6}{5} - \frac{2}{5} = \frac{4}{5}$

Step 3 Subtract the whole numbers. $2 - 1 = 1$

Step 4 Write the difference in simplest form. $3\frac{1}{5} - 1\frac{2}{5} = 1\frac{4}{5}$

Subtract. Write the difference in simplest form.

1.
$$\begin{array}{r} 5\frac{4}{7} \\ - 3\frac{6}{7} \\ \hline \end{array}$$

2.
$$\begin{array}{r} 8\frac{1}{4} \\ - 2\frac{3}{4} \\ \hline \end{array}$$

3.
$$\begin{array}{r} 11\frac{3}{9} \\ - 4\frac{5}{9} \\ \hline \end{array}$$

4.
$$\begin{array}{r} 12\frac{7}{9} \\ - 9\frac{8}{9} \\ \hline \end{array}$$

5.
$$\begin{array}{r} 3\frac{2}{6} \\ - 2\frac{5}{6} \\ \hline \end{array}$$

6.
$$\begin{array}{r} 3\frac{4}{8} \\ - 1\frac{7}{8} \\ \hline \end{array}$$

7.
$$\begin{array}{r} 4\frac{2}{5} \\ - 2\frac{4}{5} \\ \hline \end{array}$$

8.
$$\begin{array}{r} 6\frac{1}{3} \\ - 4\frac{2}{3} \\ \hline \end{array}$$

9.
$$\begin{array}{r} 5\frac{3}{7} \\ - 4\frac{5}{7} \\ \hline \end{array}$$

10.
$$\begin{array}{r} 3\frac{9}{13} \\ - 1\frac{11}{13} \\ \hline \end{array}$$

11. $2\frac{1}{4} - 1\frac{3}{4}$

12. $3\frac{3}{8} - 1\frac{6}{8}$

13. $16\frac{1}{12} - 7\frac{5}{12}$

14. $5\frac{2}{6} - 1\frac{5}{6}$

15. $5\frac{1}{3} - 3\frac{2}{3}$

16. $11\frac{3}{10} - 6\frac{7}{10}$

17. $7\frac{2}{7} - 4\frac{5}{7}$

18. $10\frac{2}{9} - 7\frac{7}{9}$

Spiral Review (Chapter 6, Lessons 3 and 4) KEY AF 1.2

Find the missing number. Identify the property you used.

19. $73 = 73 + \square$

20. $12 \times 9 = \square \times 12$

21. $(14 + 5) + 32 = 14 + (\square + 32)$

Subtract Mixed Numbers with Like Denominators

CA Standards
KEY NS 2.3, NS 2.0

Solve problems 1–6. Write your answer in simplest form.

1. Courtney and Don were working in their garden. Courtney planted $6\frac{1}{3}$ rows of peas. Don planted $4\frac{2}{3}$ rows of peas. How many more rows of peas did Courtney plant?

$$\begin{aligned} 6\frac{1}{3} &= 6 + \frac{1}{3} \\ &= 5 + 1 + \frac{1}{3} \\ &= 5\frac{4}{3} \\ &= 5\frac{4}{3} - 4\frac{2}{3} = \end{aligned}$$

3. Jill and Marsha were selling soft drinks at lunch to raise money for their class trip. Jill sold $4\frac{7}{8}$ gallons of root beer. Marsha sold $5\frac{3}{8}$ gallons of root beer. How much more root beer did Marsha sell?

5. Ben and Mary were climbing trees in their back yard. Mary climbed a tree $2\frac{3}{10}$ meters tall. Ben got halfway up a tree $4\frac{2}{5}$ meters tall. Who climbed higher? By how much?

2. Before they were ready to plant, Don weeded $16\frac{3}{8}$ rows of the garden. Courtney weeded $13\frac{5}{8}$ rows. How much more did Don weed?

4. In addition to selling soft drinks, Jill and Marsha also decided to sell bags of popcorn. Jill sold $18\frac{1}{2}$ bags of popcorn, and Marsha sold $12\frac{1}{2}$ bags of popcorn. Who sold more popcorn, and by how much?

6. Kieran and Melissa were listening to the radio. Kieran chose a station and they listened to 12 songs. When the 13th song was $\frac{1}{3}$ of the way over, Melissa changed the station. They then listened to 9 songs on the new station. When the 10th song was $\frac{2}{3}$ of the way over, Kieran changed the station again. How many more songs did they listen to on Kieran's station than on Melissa's?

Subtract Mixed Numbers

CA Standards
(KEY) NS 2.3, NS 2.0

Find $5\frac{1}{2} - 1\frac{7}{8}$.

Step 1 Use the LCD to find equivalent fractions.

$$\begin{array}{r} 5\frac{1}{2} = 5\frac{4}{8} \\ -1\frac{7}{8} = -1\frac{7}{8} \end{array}$$

Step 2 Rename the mixed numbers.

$$\begin{array}{r} 5\frac{4}{8} = 4\frac{12}{8} \\ -1\frac{7}{8} = -1\frac{7}{8} \end{array}$$

Step 3 Subtract and simplify.

$$\begin{array}{r} 4\frac{12}{8} \\ -1\frac{7}{8} \\ \hline 3\frac{5}{8} \end{array}$$

Subtract. Write each difference in simplest form.

1.
$$\begin{array}{r} 9\frac{1}{2} \\ -3\frac{3}{8} \\ \hline \end{array}$$

2.
$$\begin{array}{r} 7\frac{1}{8} \\ -2\frac{3}{6} \\ \hline \end{array}$$

3.
$$\begin{array}{r} 7\frac{1}{5} \\ -2\frac{1}{8} \\ \hline \end{array}$$

4.
$$\begin{array}{r} 4\frac{1}{4} \\ -2\frac{5}{6} \\ \hline \end{array}$$

5.
$$\begin{array}{r} 9\frac{1}{8} \\ -2\frac{1}{3} \\ \hline \end{array}$$

6.
$$\begin{array}{r} 5\frac{4}{5} \\ -2\frac{1}{4} \\ \hline \end{array}$$

7. $7\frac{15}{16} - 2\frac{4}{8}$ _____

8. $6\frac{1}{3} - 4\frac{5}{6}$ _____

9. $3\frac{1}{5} - 1\frac{9}{10}$ _____

Write $>$, $<$, or $=$ for each \bigcirc .

10. $7 - 3\frac{4}{9} \bigcirc 8\frac{1}{2} - 3\frac{1}{6}$

11. $9\frac{2}{5} - 1\frac{4}{6} \bigcirc 10 - 2\frac{4}{15}$

12. $6\frac{3}{8} - 5\frac{3}{4} \bigcirc 5\frac{1}{4} - 3\frac{5}{8}$

13. $8\frac{3}{4} - 3\frac{4}{5} \bigcirc 5\frac{1}{3} - 1\frac{5}{6}$

Spiral Review

(Chapter 8, Lessons 3) **KEY NS 2.3, MR 2.4**

Add. Write the sum in simplest form.

14. $1\frac{1}{2} + 2\frac{1}{3}$ _____

15. $4\frac{2}{7} + 3\frac{3}{7}$ _____

16. $2\frac{1}{4} + 1\frac{5}{8}$ _____

17. $8\frac{2}{3} + 5\frac{3}{4}$ _____

18. $6\frac{3}{8} + 9\frac{1}{10}$ _____

Subtract Mixed Numbers

CA Standards
KEY NS 2.3, NS 2.0

Solve problems 1–6. Write the difference in simplest form.

1. Janelle and Benjamin are measuring themselves in feet. Janelle is $5\frac{1}{3}$ feet tall. Benjamin is $5\frac{1}{2}$ feet tall. How much taller is Benjamin? Hint: Use 6 as a common denominator for the fractions.

3. Bud spent $17\frac{3}{4}$ hours at baseball practice this week. He spent $36\frac{1}{2}$ hours at school. How many more hours did he spend at school than at baseball practice?

5. Chloe was writing a play to perform with her friends. In the play, the prince and princess had to escape from a tower, but their rope of knotted bed sheets was too short. If the tower was $57\frac{1}{4}$ feet tall and the rope was $52\frac{5}{18}$ feet long, how far would they have to jump? If they added to their rope by cutting that exact length off a 6-foot long sheet, how long would the leftover piece of sheet be?

2. Kendra is $4\frac{5}{6}$ feet tall. Her sister is $5\frac{2}{3}$ feet tall. How much taller is Kendra's sister?

4. Bart subtracted $8\frac{5}{7} - 4\frac{6}{7}$ and found $4\frac{6}{7}$. Explain what Bart's mistake was. Then tell the correct answer.

6. The prince and princess in Chloe's play cut the new sheet and added to their rope of knotted sheets. They were disappointed to find that their rope was too short. Why? Give an example of possible lengths to illustrate your answer.

Problem Solving: Patterns in Tables

CA Standards
KEY NS 2.3, MR 2.3

Jessamyn makes belts in different lengths. The table shows the length of some of her belts with and without the buckles. If she makes a belt $36\frac{1}{2}$ inches long with the buckle, how long would it be without the buckle?

Look for a pattern by finding the difference between the lengths of belts with and without buckles.

$$27\frac{7}{8} \text{ in} - 26\frac{1}{4} \text{ in} = 1\frac{5}{8} \text{ in}$$

$$30 \text{ in} - 28\frac{3}{8} \text{ in} = 1\frac{5}{8} \text{ in}$$

$$34\frac{3}{8} \text{ in} - 32\frac{3}{4} \text{ in} = 1\frac{5}{8} \text{ in}$$

$$39\frac{3}{4} \text{ in} - 38\frac{1}{8} \text{ in} = 1\frac{5}{8} \text{ in}$$

Use the pattern to write a function rule using the 2 variables: $x - 1\frac{5}{8} = y$

Use the function rule to answer the question:

$$36\frac{1}{2} - 1\frac{5}{8} = 34\frac{7}{8}$$

Solution: The length of the belt was $34\frac{7}{8}$ inches before the buckle was added.

Jessamyn's Belts	
Length With Buckle (x)	Length Without Buckle (y)
$27\frac{7}{8}$ in	$26\frac{1}{4}$ in
30 in	$28\frac{3}{8}$ in
$34\frac{3}{8}$ in	$32\frac{3}{4}$ in
$39\frac{3}{4}$ in	$38\frac{1}{8}$ in

Find a pattern. Write a function rule to solve.

- Ethan's town has a train station. The table shows the length of each train's journey, with and without the stop. If a train takes $5\frac{11}{12}$ hours with the stop, how long would it take without the stop?

Length With stop (x)	Length Without stop (y)
$2\frac{2}{3}$	$2\frac{1}{2}$
$3\frac{5}{6}$	$3\frac{2}{3}$
$4\frac{3}{4}$	$4\frac{7}{12}$
$5\frac{1}{3}$	$5\frac{1}{6}$

- It takes a train $4\frac{1}{2}$ hours without a stop. How long is the length with a stop?

Name _____ Date _____

Problem Solving: Patterns in Tables

CA Standards
KEY NS 2.3, MR 2.3

Write a function rule to solve.

TABLE I		TABLE II		TABLE III	
Height of candle without holder (x)	Height of candle with holder (y)	Weight of candy (c)	Weight of candy with wrapper (w)	Measure of peg (p)	Measure of slot (s)
$6\frac{3}{4}$ in	$9\frac{1}{4}$ in	$\frac{3}{4}$ oz	$\frac{7}{8}$ oz	$9\frac{13}{16}$ mm	$8\frac{3}{4}$ mm
$6\frac{7}{8}$ in	$9\frac{3}{8}$ in	$1\frac{1}{8}$ oz	$1\frac{1}{4}$ oz	$10\frac{3}{8}$ mm	$9\frac{5}{16}$ mm
$7\frac{1}{2}$ in	10 in	$1\frac{3}{8}$ oz	$1\frac{1}{2}$ oz	$11\frac{3}{32}$ mm	$10\frac{1}{32}$ mm
$8\frac{1}{4}$ in	$10\frac{3}{4}$ in	$1\frac{1}{4}$ oz	$1\frac{3}{8}$ oz	$12\frac{1}{4}$ mm	$11\frac{3}{16}$ mm

For Problems 1–2, use Table I

- If a candle is $8\frac{1}{2}$ inches tall, how tall will it be on the candle holder?
Hint: Find the difference in height for each candle with and without the holder. Add that difference to $8\frac{1}{2}$.
-

- A new candle holder is $\frac{1}{2}$ inch shorter than the one used in the table. If a candle is $8\frac{1}{2}$ inches tall, how tall will it be on the new candle holder?
-

For Problems 3–4, use Table II.

- Chocolate wafers weigh $1\frac{5}{8}$ ounces. How much do they weigh with the wrapper?
-

- Peppermint frogs weigh $1\frac{1}{2}$ oz. How much do they weigh with the wrapper?
-

For Problems 5–6, use Table III.

- Eric uses wooden pegs to put together the furniture he builds. He always cuts the pegs slightly larger than the slots they fit into, so they will fit tightly. One of the pegs is $11\frac{7}{32}$ mm. What should be the measure of its slot?
-

- One of Eric's pegs is $8\frac{3}{32}$ mm. What should be the measure of its slot?
-

Hands On: Multiply Whole Numbers and Fractions

CA Standard
NS 2.4

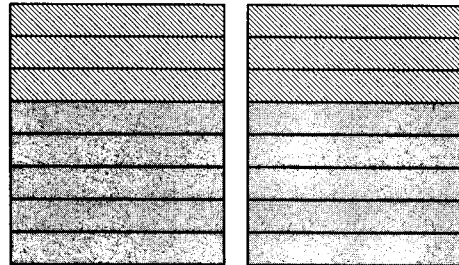
Find $2 \times \frac{3}{8}$.

Step 1 Draw two squares and lightly shade them.

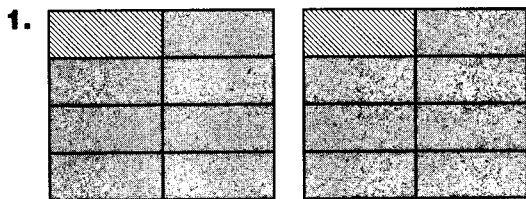
Step 2 Draw lines to divide the squares into eighths. Shade $\frac{3}{8}$ of each square again.

Step 3 Count the number of eighths that are shaded twice.

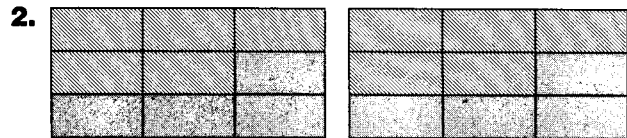
Solution: $2 \times \frac{3}{8} = \frac{6}{8}$ or $\frac{3}{4}$



Write the answer in simplest form.



$2 \times \frac{1}{3} = \underline{\hspace{2cm}}$



$2 \times \frac{5}{9} = \underline{\hspace{2cm}}$

Use models to find each product. Write the answer in simplest form.

3. $4 \times \frac{1}{8} = \underline{\hspace{2cm}}$ 4. $5 \times \frac{7}{8} = \underline{\hspace{2cm}}$ 5. $8 \times \frac{5}{6} = \underline{\hspace{2cm}}$ 6. $6 \times \frac{3}{4} = \underline{\hspace{2cm}}$

Spiral Review

(Chapter 8, Lesson 3 and Chapter 9, Lesson 4) **KEY NS 2.3, NS 2.0**

Find the sum or difference.

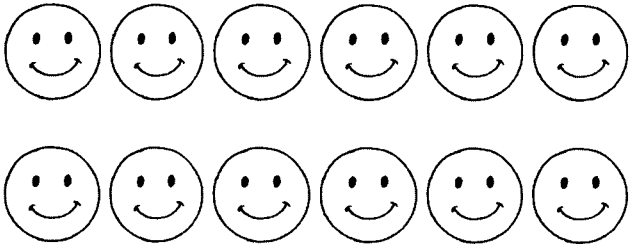
7. $3\frac{6}{7} + 1\frac{1}{2} = \underline{\hspace{2cm}}$ 8. $5\frac{4}{6} - 2\frac{2}{3} = \underline{\hspace{2cm}}$
 9. Mr. Henry has a board that is $6\frac{1}{2}$ feet long. He cuts off a piece that is $4\frac{3}{4}$ feet long. What is the length of the remaining piece?

Hands On: Multiply Whole Numbers and Fractions

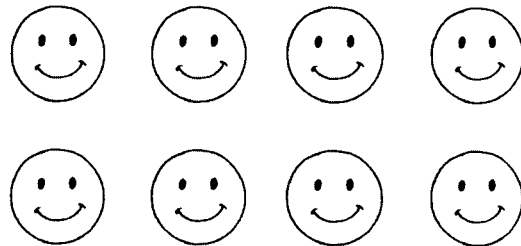
CA Standard
NS 2.4

Use models to solve Problems 1–6.

1. Dawn joined the Drama Club and became the 12th member. If $\frac{5}{6}$ of the members are girls, how many girls are in the club?



2. The Drama Club is putting on a play. Eight members are working on scenery for the play. Of the 8 members, $\frac{2}{4}$ are painting the background. How many members are painting?



3. Nine costumes are already made for the play. $\frac{2}{3}$ of those costumes are for the elves. How many elf costumes are already made?

4. The members take a break and have a snack. The director brought 20 cookies. Of those cookies, $\frac{3}{5}$ are sugar cookies. How many cookies are sugar?

5. Tickets went on sale for the play. 145 tickets were sold. Of those tickets, $\frac{2}{5}$ were adult tickets. How many adult tickets were sold?

6. Using the information in question 5, how many children's tickets were sold? If the tickets for children cost \$4 each, how much money did the play make from the sale of children's tickets?

Multiply Fractions

CA Standards
NS 2.4, NS 2.5

Different Ways to Find $\frac{2}{3}$ of $\frac{6}{8}$

Way 1 Multiply, then simplify.

$$\frac{2}{3} \times \frac{6}{8} = \frac{2 \times 6}{3 \times 8} = \frac{12}{24}$$

$$\frac{12}{24} \div \frac{12}{12} = \frac{1}{2}$$

Way 2 Simplify, then multiply.

$$\frac{2}{3} \times \frac{6}{8} = \frac{\overset{1}{\cancel{2}} \times \overset{2}{\cancel{6}}}{\underset{1}{\cancel{3}} \times \underset{1}{\cancel{4}} \times 2} = \frac{2}{4}$$

$$\frac{2 \div 2}{4 \div 2} = \frac{1}{2}$$

Solution: $\frac{2}{3} \times \frac{6}{8} = \frac{1}{2}$

Multiply. Write your answer in simplest form.

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

2. $\frac{1}{8} \times 3 =$

3. $\frac{4}{9} \times \frac{3}{7} =$

4. $\frac{2}{5} \times \frac{3}{5} =$

5. $\frac{3}{4} \times \frac{5}{6} =$

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

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

8. $6 \times \frac{2}{3} =$

9. $12 \times \frac{2}{3} =$

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

11. $\frac{8}{9} \times \frac{4}{5} =$

12. $\frac{5}{6} \times 4 =$

Spiral Review

(Chapter 8, Lesson 3 and Chapter 9, Lesson 4) **KEY NS 2.3, NS 2.0**

Find the sum or difference.

13. $8\frac{3}{5} + 3\frac{2}{10} =$ _____

14. $6\frac{9}{12} - 4\frac{1}{4} =$ _____

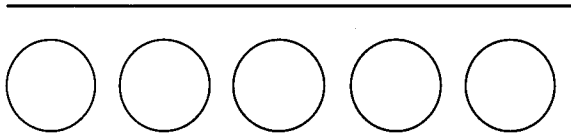
15. Sanjay spent $2\frac{1}{2}$ hours on Friday and $1\frac{3}{4}$ hours on Saturday planting flowers. How much time did he spend in all?

Multiply Fractions

CA Standards
NS 2.4, NS 2.5

Solve. Show your work.

1. Kenny is buying 5 pizzas for LaToya's party. If the boys at the party eat $\frac{3}{5}$ of the pizzas, how many pizzas will the boys eat?



3. Elyssa is baking three different types of cookies for the party. She will make $\frac{5}{8}$ of them chocolate chip, and $\frac{2}{3}$ of those cookies will have nuts. What fraction of the cookies will be chocolate chip with nuts?

2. LaToya is buying juice for her party. She wants to buy enough juice for each person to have $\frac{1}{2}$ liter. If 16 people are going to be at her party, how many liters of juice does LaToya need to buy?

4. Zack is bringing ice cream to the party. $\frac{2}{3}$ of the ice cream will be vanilla, and $\frac{1}{4}$ of the vanilla will have cookies mixed into it. What fraction of the ice cream will be vanilla with cookies?

5. Jamal brings $\frac{3}{4}$ of the 8 cold sandwiches for the party and Jill brings $\frac{2}{3}$ of the 9 hot sandwiches. Who brings more sandwiches? Explain your answer.

6. Cyndi makes 20 cupcakes. $\frac{4}{5}$ of the cupcakes are chocolate and $\frac{2}{8}$ of those have sprinkles. How many cupcakes are chocolate with sprinkles?

Multiply with Mixed Numbers

CA Standards
NS 2.4, NS 2.5

Find $3\frac{1}{3} \times \frac{3}{5}$.

Step 1 Write the mixed number as an improper fraction.

$$3\frac{1}{3} = \frac{10}{3}$$

Step 2 Use common factors to simplify. Then multiply.

$$\frac{10}{3} \times \frac{3}{5} = \frac{10 \times \cancel{3}^1}{\cancel{3}_1 \times 5} = \frac{10 \times 1}{1 \times 5} = \frac{10}{5} = \frac{2}{1}$$

Step 3 Simplify.

$$\frac{2}{1} = 2$$

Solution: $3\frac{1}{3} \times \frac{3}{5} = 2$

Multiply. Write each product in simplest form.

1. $1\frac{1}{5} \times \frac{3}{4} =$

2. $2\frac{1}{8} \times \frac{1}{4} =$

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

4. $\frac{4}{5} \times 2\frac{1}{2} =$

5. $1\frac{3}{8} \times \frac{4}{5} =$

6. $2\frac{1}{5} \times \frac{3}{7} =$

7. $3\frac{1}{4} \times \frac{8}{9} =$

8. $\frac{4}{7} \times 2\frac{3}{4} =$

9. $1\frac{2}{5} \times \frac{1}{4} =$

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

11. $\frac{5}{9} \times 3\frac{2}{3} =$

12. $5\frac{1}{2} \times \frac{4}{7} =$

Spiral Review (Chapter 9, Lessons 2–4) **KEY NS 2.3, NS 2.0**

Subtract. Write your solution in simplest form.

13. $11 - 3\frac{2}{8} =$ _____

14. $4\frac{5}{9} - 3\frac{1}{3} =$ _____

15. Maria has $6\frac{1}{2}$ yards of fabric. She uses $1\frac{7}{8}$ yard to make a vest. How much fabric does she have left?

Multiply with Mixed Numbers

CA Standards
NS 2.4, NS 2.5

Solve. Show your work

1. With her lunch, Susan got a super size cup holding $2\frac{2}{3}$ cups of milk. She was able to drink $\frac{2}{3}$ of the milk. How much milk did she drink?

$\frac{8}{3} \times \frac{2}{3} =$ _____ cup

3. Debbie is painting a fence that is $8\frac{1}{4}$ times as wide as she is tall. If Debbie is $5\frac{1}{2}$ feet tall, how many feet wide is the fence?

5. Terrance must decide which job offer to accept. One job pays \$25 per hour for $37\frac{1}{2}$ hours each week and the other pays \$825 per week regardless of how many hours he works. Which job should Terrance take?

2. Jack is painting a picture in art class. A jar of blue paint holds $4\frac{7}{8}$ cups of paint. Jack uses $\frac{2}{5}$ of the jar. How much paint has Jack used?

_____ cups

4. Scott is a disc jockey at the local radio station. The current number one song is played 12 times each day. If the song is $4\frac{1}{5}$ minutes long, how many minutes a day is the song aired?

6. Phil mows $6\frac{1}{2}$ acres of lawn each day. If he mows $\frac{2}{5}$ of the lawn before lunch, how many acres does he have to mow after lunch?
