Fractions, Decimals, and Percents

Just for Fun

Magic Square

In a Magic Square, the numbers in each row, column, and diagonal have the same sum, which is called the Magic Sum.
Complete this Magic Square.

Magic Sum: _____

9.3	3.6	
	6.0	
		2.7

What Tree Is It?

What tree does a math teacher climb?

_____ _____ _____ _____ _____ _____ _____ _____

To solve the riddle:
- unscramble the letters in each row to form a math word
- for each word, circle the letter indicated in brackets

The circled letters will solve the riddle.

gaptinree ___ ___ ___ ___ ___ ___ ___ ___ ◯   (last letter)

tvaeilnuqe ◯ ___ ___ ___ ___ ___ ___ ___ ___ ___   (1st letter)

mnoocm ___ ◯ ___ ___ ___ ___   (2nd letter)

ledcima ___ ___ ___ ___ ◯ ___ ___   (5th letter)

rotaremun ___ ___ ___ ◯ ___ ___ ___ ___   (4th letter)

ncafrtio ___ ___ ___ ___ ◯ ___ ___ ___   (5th letter)

dnmortaeino ___ ___ ___ ___ ___ ___ ___ ___ ___ ◯ ___   (last letter)

umltipyl ___ ___ ___ ___ ___ ___ ◯ ___   (last letter)

Activating Prior Knowledge

Mental Math

There are many ways to calculate mentally.
- Look for 10s, or the nearest 10.
- Add or subtract in a different order.
- Separate a number into smaller parts to obtain friendly numbers.

Example 1

Use mental math.

a) 36×4 **b)** $403 + 55 - 4$ **c)** $305 + 498$

Solution

a) Separate 36 into 30 and 6:
$30 \times 4 + 6 \times 4$
$= 120 + 24$
$= 144$

> I have a different approach for part a.
> I know double 35 is 70, and double that is 140. Then I added 4 to get $36 \times 4 = 144$.

b) Subtract first: **c)** $498 = 500 - 2$
$55 - 4 = 51$ Then: $305 + 500 - 2 = 803$
Then: $403 + 51 = 454$

✓ Check

1. Use mental math.
   a) $289 + 171 = 289 + \rule{1cm}{0.4pt} + 170$ **b)** 51×2

   $= \rule{2cm}{0.4pt} + 170$ $50 \times 2 = \rule{2cm}{0.4pt}$ $1 \times 2 = \rule{1.5cm}{0.4pt}$

   $= \rule{1.5cm}{0.4pt}$ $\rule{3cm}{0.4pt}$

2. Use mental math. Explain your strategy.
   a) $65 \times 3 = \rule{3cm}{0.4pt}$ **b)** $158 + 86 = \rule{3cm}{0.4pt}$ **c)** $34 \times 25 \times 4 = \rule{2.5cm}{0.4pt}$

   \rule{4cm}{0.4pt}   \rule{4cm}{0.4pt}   \rule{4cm}{0.4pt}

   \rule{4cm}{0.4pt}   \rule{4cm}{0.4pt}   \rule{4cm}{0.4pt}

Percent

Percent means "per hundred" or "out of 100."
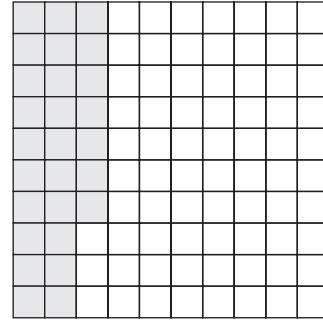One whole, or 1, is 100%.

So: 25% is $\frac{25}{100}$ 4% is $\frac{4}{100}$ 100% is $\frac{100}{100}$ or 1

Example 2

This is a hundredths grid.

a) What percent of the hundredths grid is shaded?
b) What percent of the hundredths grid is not shaded?

Solution

a) 27 out of 100 squares are shaded.

$\frac{27}{100} = 27\%$

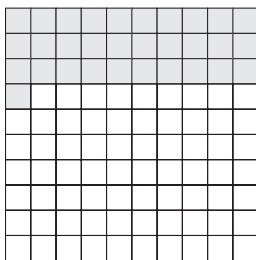27% of the grid is shaded.

b) 73 out of 100 squares are not shaded.

$\frac{73}{100} = 73\%$
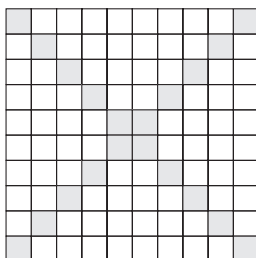
73% of the grid is not shaded.

✓ Check

3. Write a fraction with denominator 100 for the shaded part of each hundredths grid.
Then write each fraction as a percent.

a)

_____ = _____

b)

_____ = _____

Key to Success

Study with a classmate.
- Share the same problem.
- Compare your problem-solving strategies.
- Does your strategy have an advantage over your classmate's?

Quick Review

➤ $\frac{1}{4}$ is read as one-fourth, or one-quarter.

$\frac{1}{4}$ means 1 divided by 4.

➤ To write a fraction as a decimal:

• Change the fraction to an equivalent fraction with a denominator of 10, 100, or 1000.

$$\frac{1}{4} = \frac{25}{100} = 0.25$$

(×25)

• Or, divide the numerator by the denominator.
1 divided by 4

$$\begin{array}{r} 0.25 \\ 4\overline{)1.00} \\ \underline{8} \\ 20 \\ \underline{20} \\ 00 \end{array}$$

0.25 is a terminating decimal.
It has a definite number of decimal places.

➤ Look at this fraction:
$\frac{25}{99} = 0.252525\ldots = 0.\overline{25}$

$0.\overline{25}$ is a repeating decimal.
You draw a bar over the repeating digits.

➤ You can use patterns to change some decimals to fraction form.
Since $\frac{4}{9} = 0.\overline{4}$ $\frac{5}{9} = 0.\overline{5}$ $\frac{8}{9} = 0.\overline{8}$,
you can use the pattern to predict that the fraction for $0.\overline{2}$ is $\frac{2}{9}$.

Practice

1. Identify each decimal as terminating or repeating.

a) 2.5_____ **b)** 9.0_____

c) $22.\overline{2}$_____ **d)** 0.37_____

e) $2.\overline{152}$_____ **f)** 3.125_____

2. Match each fraction with its corresponding decimal.

$\frac{5}{9}$ $\qquad$ $0.1\overline{6}$ $\qquad$ Which fractions form terminating decimals?

$\frac{16}{99}$ $\qquad$ $0.\overline{5}$ $\qquad$ _____

$\frac{1}{6}$ $\qquad$ 0.5 $\qquad$ Which fractions form repeating decimals?

$\frac{5}{10}$ $\qquad$ $0.\overline{16}$ $\qquad$ _____

3. Complete this table.

Fraction in simplest form				$\frac{12}{25}$		$\frac{9}{50}$
Fraction with denominator 10, 100, or 1000	$\frac{6}{10}$		$\frac{125}{1000}$			
Decimal		0.35			0.256	

4. Use a calculator to write each fraction as a decimal.

a) $\frac{2}{9}$ _____ **b)** $\frac{5}{8}$ _____ **c)** $\frac{5}{24}$ _____

5. a) Express the fractions $\frac{8}{99}$, $\frac{9}{99}$, $\frac{10}{99}$, $\frac{11}{99}$, as decimals.

_____

b) Describe the pattern in the decimals in part a.

_____

_____

c) Use the pattern to predict the decimal forms of $\frac{5}{99}$ and $\frac{21}{99}$. _____

> **Tip**
> Divide the numerator by the denominator to change a fraction to a decimal.

Quick Review

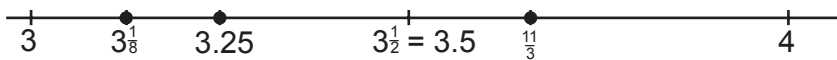To order 3.25, $3\frac{1}{8}$, and $\frac{11}{3}$ from least to greatest:

➤ Use benchmarks on a number line.
Compare the fraction parts of the numbers.
3.25 is halfway between 3 and 3.5. $3\frac{1}{8}$ is close to 3.

$\frac{11}{3} = \frac{9}{3} + \frac{2}{3} = 3\frac{2}{3}$

$3\frac{2}{3}$ is greater than $3\frac{1}{2}$.

```
 ├──────┼────┼──────────────┼───────┼────────────────┼──
 3     3⅛  3.25          3½ = 3.5   11/3             4
```

So, from least to greatest: $3\frac{1}{8}$, 3.25, $\frac{11}{3}$

➤ Use place value.
Express each number as a decimal. Use a calculator.

3.25 $3\frac{1}{8} = 3.125$ $\frac{11}{3} = 3.\overline{6}$

Compare the digits, beginning with the greatest place value.
In the ones place: 3.25, 3.125, and $3.\overline{6}$ have the same value, which is 3.
In the tenths place: 1 tenth < 2 tenths < 6 tenths
So, $3.125 < 3.25 < 3.\overline{6}$

So, from least to greatest: $3\frac{1}{8}$, 3.25, $\frac{11}{3}$

To write a fraction between $3\frac{1}{8}$ and $3\frac{1}{4}$:

Since $3\frac{1}{4} = 3\frac{2}{8}$, find a fraction between $3\frac{1}{8}$ and $3\frac{2}{8}$.

Write equivalent fractions with common denominator 16.

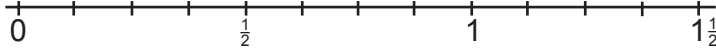$3\frac{1}{8} = 3\frac{2}{16}$ $3\frac{2}{8} = 3\frac{4}{16}$

Look at the numerators: 3 is between 2 and 4

So, $3\frac{3}{16}$ is between $3\frac{1}{8}$ and $3\frac{1}{4}$.
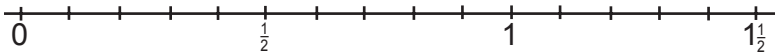
Practice

1. Use the number line to order each set of numbers from least to greatest.

a) $\frac{7}{8}$, $\frac{5}{8}$, $\frac{3}{8}$, $\frac{10}{8}$

From least to greatest: _____

b) $\frac{4}{10}$, $\frac{12}{10}$, $\frac{9}{10}$, $1\frac{4}{10}$

From least to greatest: _____

2. Write >, <, or =.

a) $\frac{11}{7}$ ___ $\frac{10}{9}$ **b)** $\frac{21}{8}$ ___ $\frac{31}{12}$ **c)** $\frac{17}{7}$ ___ $2\frac{3}{4}$

d) $1\frac{1}{2}$ ___ $\frac{24}{16}$ **e)** $\frac{24}{5}$ ___ $\frac{48}{10}$ **f)** $3\frac{4}{5}$ ___ $\frac{78}{25}$

> **Tip**
> *Find equivalent fractions.*

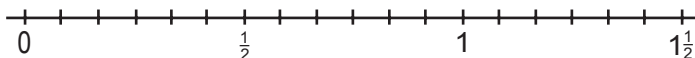**3.** Use benchmarks and a number line to order this set of numbers from greatest to least.

$\frac{7}{12}$, $\frac{5}{6}$, $\frac{3}{4}$, $\frac{2}{3}$
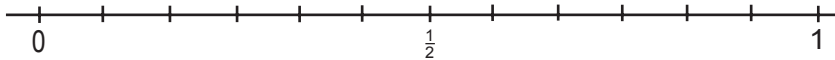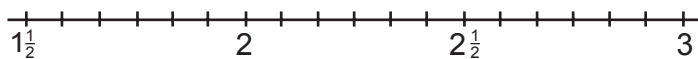

From greatest to least: _____

4. Use benchmarks and a number line to order each set of numbers from least to greatest.

a) $\frac{11}{12}$, $\frac{1}{3}$, $\frac{7}{6}$, $\frac{5}{4}$

From least to greatest: _____

b) $2\frac{1}{12}$, $\frac{15}{8}$, $\frac{17}{6}$, $2\frac{3}{4}$

From least to greatest: _____

5. Write each fraction as a decimal. Then insert <, >, or =.

a) $\frac{1}{2}$ _____ 0.43: _____

b) $\frac{1}{12}$ _____ $0.\overline{3}$: _____

c) 0.675 _____ $\frac{7}{8}$: _____

d) 0.575 _____ $\frac{7}{12}$: _____

6. Use place value to order each set of numbers from least to greatest.

a) 0.97, $\frac{7}{8}$, $\frac{19}{20}$, 0.8, $\frac{9}{10}$: _____

From least to greatest: _____

b) $1\frac{5}{12}$, $1.\overline{552}$, $1\frac{9}{16}$, 1.89, $1.0\overline{12}$: _____

From least to greatest: _____

7. Determine a number between the two given numbers. Answers may vary.

a) $\frac{4}{3}$ ___ $\frac{7}{6}$ **b)** $2\frac{1}{10}$ ___ $\frac{11}{5}$ **c)** $5\frac{1}{5}$ _____ 5.3   **d)** $1.\overline{3}$ ___ $\frac{10}{6}$

8. Jeremiah thinks that $3\frac{5}{8}$, $\frac{35}{8}$, and 3.58 are equivalent. Is he correct? _____

Explain how you know. _____

_____

Quick Review

➤ Add: 5.763 + 3.94

Step 1 Use front-end estimation to estimate the sum: 5 + 3 = 8
Step 2 Add. Write each number with the same number of decimal places,
using zeros as place holders. Record the numbers without the decimal points.

```
   5763
 + 3940
   9703
```

Since the estimate is 8, place the decimal point after the 9.
The sum is 9.703.

➤ Subtract: 5.763 – 3.94

Step 1 Use front-end estimation to estimate the difference: 5 – 3 = 2
Step 2 Subtract. Write each number with the same number of decimal places,
using zeros as place holders. Record the numbers without the decimal points.

```
   5763
 – 3940
   1823
```

Since the estimate is 2, place the decimal point after the 1.
The difference is 1.823.

Practice

1. Use front-end estimation to estimate each sum or difference.

   a) 13.1 + 2.4 _____   **b)** 4.52 + 3.09 _____

   c) 87.6 – 73.5 _____   **d)** 8.47 – 7.16 _____

2. Add. Use front-end estimation to place the decimal point.

   a) 3.51 + 9.73   **b)** 2.168 + 0.948   **c)** 7.169 + 8.47   **d)** 6.7 + 0.491

   _____   _____   _____   _____

Tip
Rewrite the question to make the calculation easier.

3. Subtract. Use front-end estimation to place the decimal point.

   a) 9.73 – 0.41   **b)** 6.371 – 1.09   **c)** 4.152 – 4.097   **d)** 3.6 – 1.981

   _____   _____   _____   _____

4. The difference in the masses of 2 objects is 0.479 kg.

   a) What might the mass of each object be? _____

   b) What might the objects be? _____

5. Salvatore ran 2.457 km on Saturday and 3.169 km on Sunday.

   a) Estimate to find out about how far he ran on both days. _____

   b) Calculate how far Salvatore ran on both days. _____

   c) Estimate how much farther he ran on Sunday than on Saturday. _____

   d) Calculate how much farther Salvatore ran on Sunday than on Saturday. _____

6. When the Andisons left on a trip, the trip meter on their car showed 63589.2 km. When they returned home, the trip meter showed 67178.4 km.

   a) Estimate to find the distance the Andisons drove on their trip. _____

   b) Calculate the distance the Andisons drove. _____

7. Silvia purchased these groceries: peanut butter for $3.18, smoked turkey for $5.43, bread for $2.29, milk for $1.89, and fish for $6.79.

   a) Estimate to find the total cost of the groceries without tax.

   _____

   b) Calculate the total cost of Silvia's purchases. _____

   c) What is the difference in prices of the peanut butter and the fish? _____

   d) Silvia gave the clerk $20.00. How much change should she receive? _____

8. Paul packages boxes of apples for an orchard. In one hour, Paul lifted, weighed, and stored five boxes of apples with these masses: 9.71 kg, 9.39 kg, 8.97 kg, 8.72 kg, 8.98 kg

   a) Estimate to find the total mass. _____

   b) Calculate the total mass. _____

At Home At School

Quick Review

➤ You can use Base Ten Blocks to multiply decimals.
To multiply 2.4×1.8, display the Base Ten Blocks as shown.
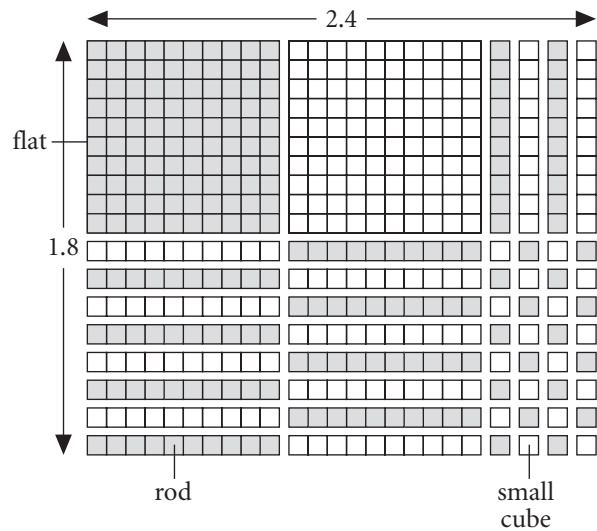The flat represents 1.
The rod represents 0.1.
The small cube represents 0.01.
This picture shows the product
$2.4 \times 1.8 = 1 + 1 + 0.8 + 0.8 + 0.4 + 0.32$
$= 4.32$

2.4

flat

1.8

rod

small
cube

➤ You can multiply decimals the same
way you multiply whole numbers.
To multiply 2.4×1.8, multiply 24×18.

$$\begin{array}{r} 24 \\ \times\ 18 \\ \hline 432 \end{array}$$

Use front-end estimation to place the decimal point: $2 \times 1 = 2$
So, 2.4×1.8 is about 2.
Place the decimal point between the 4 and the 3.
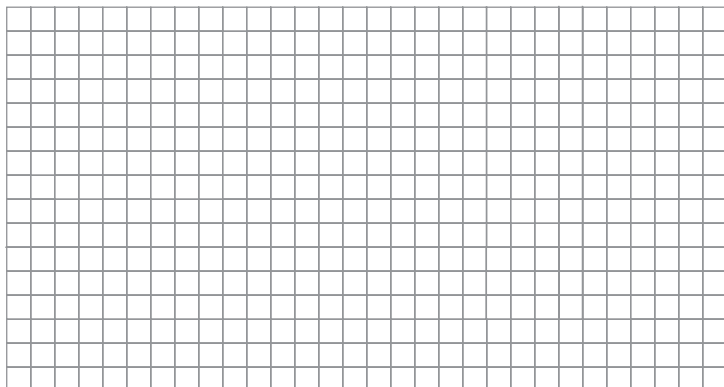So, the product is 4.32.

Practice

1. Write a multiplication equation for each picture.
Each small square represents 0.01.

a)

b)

_____   _____
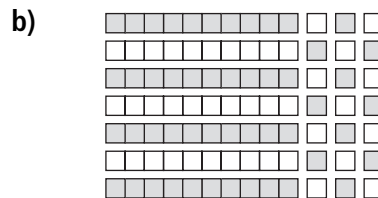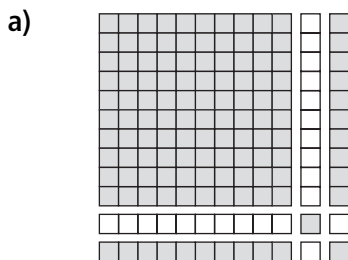
2. Use Base Ten Blocks to find each product.
Record your work on the grid.

a) 2.6×1.3

_____ flats × 1 = _____
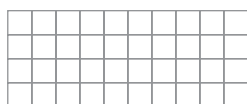
_____ rods × 0.1 = _____

_____ small cubes = _____

The product is _____ + _____ + _____ = _____

b) 2.1×0.8

The product is _____.

c) 0.7×0.3

The product is _____.

3. Multiply. Use front-end estimation to place the decimal point in the answer.

a) 6.3×0.7
Multiply: 63×7

$$\begin{array}{r} 63 \\ \times\ 7 \\ \hline \end{array}$$

Estimate to place the decimal point.

$6.3 \times 0.7 =$ _____

b) 1.8×1.4
Multiply: 18×14

$1.8 \times 1.4 =$ _____

c) 4.8×6

d) 3.4×2.1

e) 0.4×1.4

$4.8 \times 6 =$ _____

$3.4 \times 2.1 =$ _____

$0.4 \times 1.4 =$ _____

4. A rectangular room measures 2.3 m by 3.2 m.
Find the area of the room.

_____

5. The product of 2 decimals is 0.24.
Write 3 pairs of decimals that give this product.

_____   _____   _____

6. Chiang has a part-time job as a playground leader supervising children.
Her hourly wage is $9.25. She works 17.5 h per week.

a) Find Chiang's weekly wage.

Estimate: _____   Calculation: _____
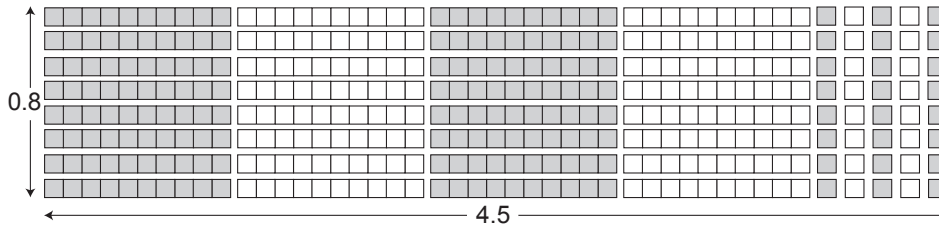
b) How much money would Chiang earn in 5 weeks?_____

Quick Review

➤ You can use Base Ten Blocks to divide decimals,
similar to the way you multiplied decimals.
For example, to divide 3.6 ÷ 0.8:
Make a rectangle with an area of 3.6 and a width of 0.8:

The length of the rectangle is 4.5.
So, 3.6 ÷ 0.8 = 4.5

➤ You can also divide decimals the same way as you divide whole numbers.
Use front-end estimation to place the decimal point.
For example, to divide 24.3 ÷ 0.6:
Estimate first: 24 ÷ 1 = 24
So, 24.3 ÷ 0.6 is about 24.

Divide as you would whole numbers.

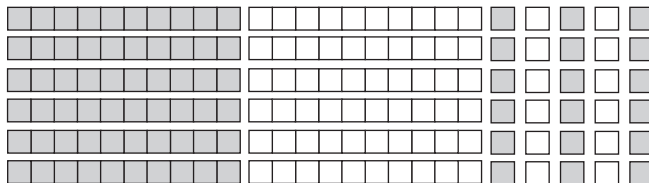$$\begin{array}{r} 405 \\ 6\overline{)2430} \\ 24 \\ \hline 03 \\ 00 \\ \hline 30 \\ 30 \\ \hline 00 \end{array}$$

Divide until
the quotient
terminates.

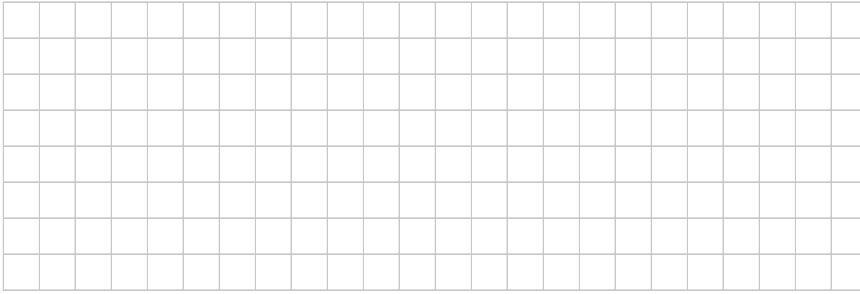Since the estimate was 24, place the decimal point after the zero: 24.3 ÷ 0.6 = 40.5

Practice

1. Write a division equation for this picture. Each small square represents 0.01.
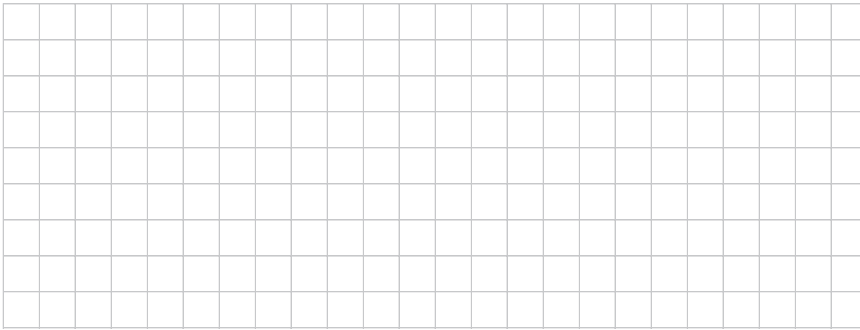
_____

2. Use Base Ten Blocks to find each quotient.
   Record your work on the grid.

   a) 0.8 ÷ 0.5

   The quotient is:_____

   b) 0.98 ÷ 0.7

   The quotient is:_____

3. Divide.
   a) 17.4 ÷ 2.4   **b)** 34.2 ÷ 3.6

       17.4 ÷ 2.4 is about

       _____ ÷ _____ = _____

       So, 17.4 ÷ 2.4 = _____   So, 34.2 ÷ 3.6 = _____

   c) 89.9 ÷ 3.1 = _____   **d)** 15.3 ÷ 6.8 = _____

4. Divide.

a) $452 \div 10 =$ _____

$452 \div 100 =$ _____

$452 \div 1000 =$ _____

b) $89.12 \div 10 =$ _____

$89.12 \div 100 =$ _____

$89.12 \div 1000 =$ _____

Describe any patterns you see.

_____

_____

_____

5. Divide.

a) $452 \div 0.1 =$ _____

$452 \div 0.01 =$ _____

$452 \div 0.001 =$ _____

b) $89.12 \div 0.1 =$ _____

$89.12 \div 0.01 =$ _____

$89.12 \div 0.001 =$ _____

Describe any patterns you see.

_____

_____

_____

6. Divide. Estimate to place the decimal point.

a) $3.9 \div 0.6$

$3.9 \div 0.6$ is about:_____

So, $3.9 \div 0.6 =$ _____

b) $6.2 \div 0.8$

$6.2 \div 0.8$ is about: _____

So, $6.2 \div 0.8 =$ _____

c) $8.51 \div 0.2$

$8.51 \div 0.2$ is about: _____

So, $8.51 \div 0.2 =$ _____

d) $6.7 \div 0.5$

$6.7 \div 0.5$ is about: _____

$6.7 \div 0.5 =$ _____

7. A case of soup is on sale for $18.63.
There are 27 cans in a case.

What is the cost of each can of soup? _____

8. Divide. Write each quotient to the nearest tenth if necessary.

a) $5.14 \div 1.07 =$ _____   **b)** $95 \div 5.4 =$ _____

c) $80.96 \div 41.8 =$ _____   **d)** $381.5 \div 2.4 =$ _____

9. Sheldon rode his bicycle 53.4 km in 3 days.
He rode the same distance each day.
How far did Sheldon ride in 1 day?

_____

10. Nadine has a part-time job after school.
She earns $91.98 for working 12.6 h.
How much does Nadine earn per hour? Use a calculator to find out.

_____

11. The possible quotients for $72.09 \div 8.1$ are: 0.89, 89, 890, and 8.9.
Which number is correct? Explain how you know.

_____

_____

_____

12. The area of a rectangular room is approximately 47.3 m^2.
The width of the room is 5.4 m.
Find the length of the room.
Write your answer to the nearest tenth.

Key to success

As you work through the
Practice questions, ask:
- What have I learned?
- Do I understand?
- What am I not sure about?

_____

Quick Review

You can use the same order of operations for decimals as you can for whole numbers.

Here is the order of operations.
• Do the operations in brackets first.
• Then divide and multiply, in order, from left to right.
• Then add and subtract, in order, from left to right.

Practice

1. Evaluate.

a) $1.2 + 3.1 \times 2 - (2.7 + 0.6) \div 3$ 　　　　Calculate in brackets.

= _____ 　　　　Multiply and divide from left to right.

= _____ 　　　　Add and subtract from left to right.

= _____

b) $9.9 + 5 \times 4.6$ 　　　　　　　c) $(6.2 - 2.6) \div 2 = $ _____

= _____

= _____

2. Evaluate.

a) $7 \times (6 + 7.1) = $ _____ 　　　b) $16 - 9.6 \div 3.2 = $ _____

c) $5.8 + 12.3 \times 3 = $ _____ 　　　d) $4.9 + 17.6 \div 8 = $ _____

3. a) Evaluate each expression.

$(5.3 + 7.5) \times (3 - 1) =$ _____ $5.3 + 7.5 \times 3 - 1 =$ _____

b) The numbers and operations are the same in the two expressions in part a.
Explain why the results are different.

_____   _____

_____   _____

_____   _____

_____

_____

4. a) Evaluate each expression.

$7.2 \times 4.2 + 3.4 =$ _____ $(7.2 \times 4.2) + 3.4 =$ _____

b) Explain the results.

_____

_____

_____

5. Evaluate.

a) $3.6 \times 5 - 4.8 \div 4 + 10.2 =$ _____   **b)** $(8.4 + 3.6) \div 6 \times 10 - 9.5 \times 2 =$ _____

6. A radio station contest used this skill-testing question: $4 + 6 \times 1.3 - 2.4 \div 2$
Grace said the answer was 10.6. Rob said the answer was 5.3.
Who was correct? How do you know?
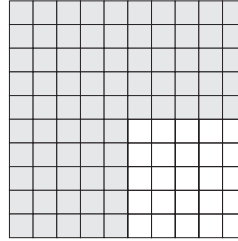
_____

_____

_____

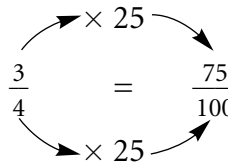## Quick Review

You can describe part of a whole in 3 ways:
- as a fraction
- as a decimal
- as a percent

The hundredths grid has $\frac{3}{4}$ of the squares shaded.

➤ To write a fraction as a percent, first write the fraction with denominator 100.
75 out of 100 squares are shaded.

So, $\frac{3}{4} = 75\%$

$$\times 25$$
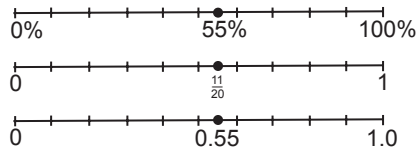$$\frac{3}{4} = \frac{75}{100}$$
$$\times 25$$

Since percent means per hundred, $\frac{75}{100} = 75\%$

If you divide 75 by 100, $\frac{75}{100} = 0.75$

So, $75\% = 0.75$

➤ You can use number lines to show the relationships among fractions, decimals, and percents. For example:
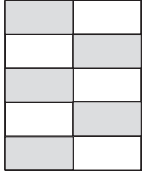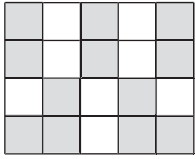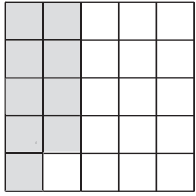
$55\% = 0.55 = \frac{55}{100} = \frac{11}{20}$

0%   55%   100%
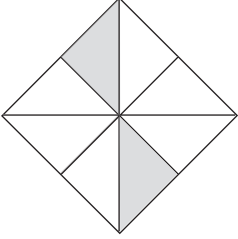
0    $\frac{11}{20}$ 1

0   0.55   1.0

Practice

1. Use a fraction, decimal, and percent to describe the shaded part of each grid.

a)

b)

2. Complete the chart.

Shape	Shaded region as a fraction	Shaded region as a decimal	Shaded region as a percent

3. Write each fraction as a decimal, and then as a percent.
Use a calculator if necessary.

a) $\dfrac{3}{10}$ = _____ = _____

b) $\dfrac{9}{10}$ = _____ = _____

c) $\dfrac{8}{50}$ = _____ = _____

d) $\dfrac{9}{20}$ = _____ = _____

e) $\dfrac{2}{5}$ = _____ = _____

f) $\dfrac{12}{40}$ = _____ = _____

g) $\dfrac{1}{5}$ = _____ = _____

h) $\dfrac{6}{30}$ = _____ = _____

i) $\dfrac{3}{25}$ = _____ = _____

4. Bennett had 19 out of 20 on a spelling test.
Write Bennett's mark as a percent.

_____

5. In Ms. Khan's class, 22 out of 25 students hand in their projects on time.
What percent of the students hand in their projects on time?

_____

6. Use 4 different colours to shade the squares on the hundredths grid below, as given in the table.
Describe each coloured part as a fraction, a decimal, and a percent.

Colour	Fraction	Decimal	Percent
Red	$\dfrac{6}{25}$		
Yellow			35%
Green		0.20	
Purple			18%
White			
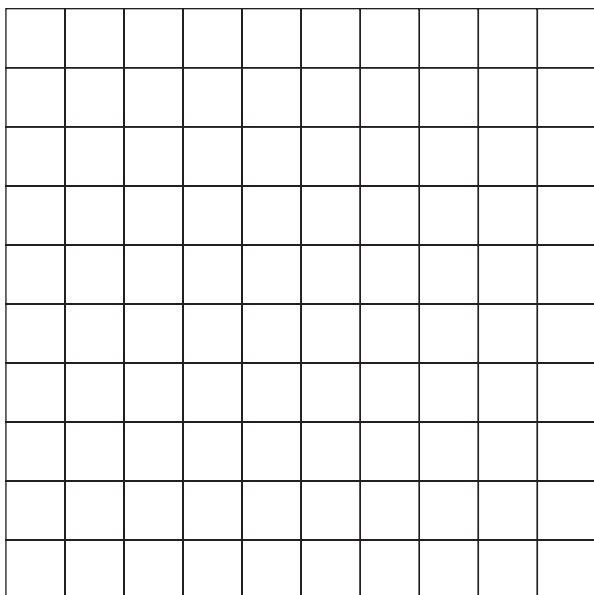
7. Lucy and Victor are sharing pens.

Lucy has $\frac{1}{4}$ of the pens, and Victor has 20% of the pens.

Who has more pens? Explain.

Since _____% > _____%, _____

8. Raymond surveyed 10 classmates to find out which shoe, left or right, each person puts on first.
His results are shown in this table.

Left Shoe First	Right Shoe First
⑪卌	|||||

a) What percent of the students surveyed put on their left shoe first?

_____

b) What percent of the students surveyed put on their right shoe first?

_____

9. The Fashion Depot is having a big sale this week.

Everything is $\frac{1}{5}$ off the regular price.

What percent of the regular price do you pay? Explain.

HINT
The regular price is 100%.
Write $\frac{1}{5}$ as a percent.
Then, subtract from
the regular price.

_____

Quick Review

At Home
At School

A scooter originally cost $90.00.
It is on sale at 40% off.
To find how much you save on the scooter,
find 40% of $90.00.

H I N T

To calculate a percent of a number, write the percent as a decimal.

$40\% = \dfrac{40}{100} = 0.40$

So, 40% of $90.00 = 0.4 × 90
To multiply 0.4 × $90, multiply
without the decimal point.

$$\begin{array}{r} 90 \\ \times\ \ 4 \\ \hline 360 \end{array}$$

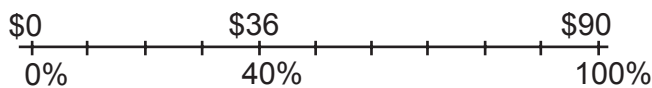Estimate to place the decimal point.
$90 is about $100.
1% of $100 is $1.
So, 40% of $100 is $40.

Insert the decimal point between the 6 and the 0.
So, 40% of $90 is $36.00.
You save $36 on the scooter.
You can show this on a number line.

```
$0            $36              $90
+--+--+--+--+--+--+--+--+--+--+
 0%           40%             100%
```

Practice

1. Find 10% of each number.

a) 60

10% of 60 = 0.1 × 60 = _____

b) 85

10% of 85 = _____ × _____ = _____

c) 150

_____

d) 55

_____

2. Find 30% of each number in question 1.

a) 3 × _____ = _____

30% of 60 = _____

b) 3 × _____ = _____

30% of 85 = _____

c) _____

30% of 150 = _____

d) _____

30% of 55 = _____
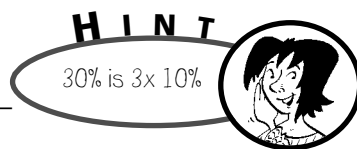
3. Find each percent.

a) 7% of 80

$7\% = \dfrac{7}{100} =$ _____

_____ × 80 = _____

b) 1% of 25.5

_____

_____

c) 20% of 60.5

_____

_____

d) 37% of 182

_____

_____
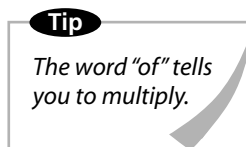
4. Asher's new backpack costs $29.95, plus 14% sales tax.

a) How much sales tax does Asher pay? _____

b) How much does Asher pay in total for the backpack? _____

5. Here is a diagram of Sanjay's patio.
What percent of the patio does the hot tub take up?
Show your work.
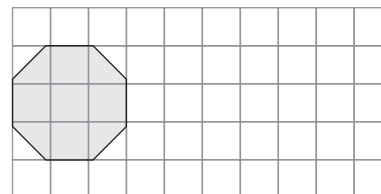
The hot tub takes up about _____ of Sanjay's patio.

6. Marco's dinner bill is $14.80.
   He leaves the server a 15% tip.
   How much does Marco pay for his dinner, including the tip?
   Show your work.

   So, Marco paid _____ for his dinner.

7. There are 620 students at Irena's school.
   Of these students, 45% have attended at least one other school.

   a) How many students have attended more than 1 school?

      So, _____ students have attended more than 1 school.

   b) How many students have attended just 1 school?

      So, _____ students have attended just 1 school.

8. Hraa has 120 baseball cards.
   She gives 25% of them away.
   How many cards does Hraa have left?

   Hraa has _____ cards left.

9. Which would you rather have? Explain.
   90% of $70 or 15% of $500

   _____

In Your Words

Here are some of the important mathematical words of this unit.
Build your own glossary by recording definitions and examples here. The first one is done for you.

fraction

a way to show part of a whole; for example, $\frac{3}{4}$ shows 3 parts of a whole that has been divided into 4 equal parts

A fraction also shows division: $3 \div 4$

benchmark

equivalent fractions

repeating decimal

terminating decimal

percent

List other mathematical words you need to know.

_____

Unit Review

3.1 **1.** Write each fraction as a decimal.
Identify each decimal as terminating or repeating.

> Tip
>
> $\frac{3}{4} = 3 \div 4 = 0.75$

a) $\frac{3}{10}$ _____

b) $\frac{1}{3}$ _____

c) $\frac{7}{8}$ _____

d) $\frac{1}{5}$ _____

2. Write each decimal as a fraction or mixed number.

a) 0.6 ____   b) 0.75 ____   c) 2.5 ____   d) $0.\overline{7}$ ____

3.2 **3.** Order the numbers from least to greatest. Use the number line.

$0.9, \frac{11}{10}, \frac{4}{5}, 1.4, 1\frac{7}{20}$
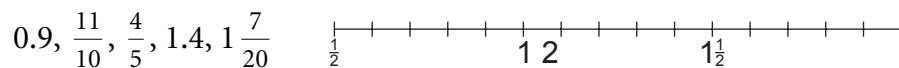
From least to greatest: _____

4. Use equivalent fractions to order these numbers from greatest to least:

$2\frac{1}{2}, 1\frac{3}{8}, 2\frac{3}{5}, 1\frac{7}{10}$

From greatest to least: _____

5. Use place value to order these numbers from least to greatest:

$1.3825, 1\frac{4}{5}, 1.236, 1\frac{1}{3}, 1.333, 1.810$

From least to greatest: _____

3.3 **6.** Matthew bought a shirt for $21.99, pants for $36.78, and a belt for $10.50.

What is the total amount for the purchases without sales tax? _____

7. Kerry has grown 2.1 cm since last September.
She is now 165 cm tall.

How tall was Kerry last September?_____

3.4 **8.** Multiply. Use front-end estimation to place the decimal point in the answer.

a) $0.5 \times 0.7 =$ _____   b) $2.9 \times 0.8 =$ _____

c) $3.5 \times 3.2 =$ _____   d) $1.4 \times 2.9 =$ _____

9. Anne cycles 15.5 km each hour.
She cycles for 3.25 h.

How far does Ann cycle? _____

3.5 **10.** Divide. Write each quotient to the nearest tenth where necessary.

a) $8.7 \div 0.6 =$ _____   b) $5.7 \div 1.5 =$ _____

c) $43.1 \div 2.1 =$ _____   d) $23.5 \div 4.8 =$ _____

11. Amal bought 3.5 kg of bananas for $2.42.

What was the cost of 1 kg of bananas? _____

3.6 **12.** Evaluate.

a) $5.3 - 2.3 \times 2 =$ _____   b) $(67.2 + 12) \div 2.4 - 1.2 =$ _____

> **Tip**
>
> *The order of operations with decimals is the same as with whole numbers.*

3.7 **13.** Write each fraction as a decimal and a percent.

a) $\frac{1}{2} =$ ____ $=$ _____   b) $\frac{17}{25} =$ _____ $=$ _____

c) $\frac{19}{20} =$ _____ $=$ _____   d) $\frac{3}{5} =$ ____ $=$ _____

3.8 **14.** Ivana got $\frac{21}{25}$ on her science test.

She got 86% on her math test.

Which of her test marks is greater? Explain.

Ivana's _____ test mark is greater.

15. Find each percent.

a) 3% of 25   b) 24% of $9.00   c) 40% of 95

$3\% = \frac{3}{100} = 0.03$ $24\% =$

$0.03 \times 25 =$ _____   _____   _____

16. Sylvia is going to buy a new jacket.
The regular price is $68.00.
The jacket is on sale for 25% off.
There is 14% sales tax on the jacket.
How much will Sylvia pay for the jacket?

Sylvia will pay _____ for the jacket.