Simple Solutions.

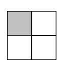
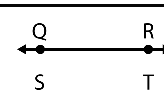
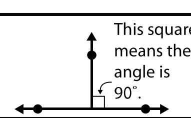
Minutes a Day–Mastery for a Lifetime!

Standards-Based Mathematics 4

Help Pages

Help Pages

Vocabulary

Acute angle — an angle measuring less than 90°
Area — the amount of space within a polygon; area is always measured in square units (feet^2, meters^2,…)
Congruent — figures with the same shape and the same size
Decimal — a number that contains a decimal point; any whole number or fraction can be written as a decimal **Example:** $\frac{1}{10}$ = 0.10
Denominator — the bottom number of a fraction **Example**: $\frac{1}{4}$; the denominator is 4.
Difference — the result or answer to a subtraction problem **Example**: The difference of 5 and 1 is 4.
Equivalent fractions — fractions with different names but equal value
Factor — all of the whole numbers that can be divided exactly into a given number The factors of 6 are 1 and 6, 2 and 3.
Fraction — a part of a whole **Example**:  This box has 4 parts. 1 part is shaded. $\frac{1}{4}$ is shaded.
Line — has no endpoints, goes forever in two directions 
Line of symmetry — a line along which a figure can be folded so that the two halves match exactly
Line segment – line with end points Say, "line segment MN" or "line segment NM." 
Mixed number — the sum of a whole number and a fraction **Example**: $5\frac{3}{4}$
Multiple — the product of two whole numbers When you skip count by twos, you say the multiples of two.
Numerator — the top number of a fraction **Example**: $\frac{1}{4}$; the numerator is 1.
Obtuse angle — an angle measuring more than 90°
Parallel lines — two lines that never intersect and are always the same distance apart 
Perimeter — the distance around the outside of a polygon
Perpendicular lines — lines that intersect and form a right angle (90°) 
Point — has no length or width; named with a capital letter ● *A*

Help Pages

Vocabulary

Product — the result or answer to a multiplication problem	**Example**: The product of 5 and 3 is 15.
Quotient — the result or answer to a division problem	**Example**: The quotient of 8 and 2 is 4.
Ray — a line that goes on in one direction	Say, "ray FG." 
Right angle — an angle measuring exactly 90°	
Sum — the result or answer to an addition problem	**Example**: The sum of 5 and 2 is 7.
Unit fraction — a fraction with a numerator of 1	

Geometry — Polygons — Two-dimensional

Number of Sides	Name	Number of Sides	Name
3	Triangle	5	Pentagon
4	Quadrilateral	6	Hexagon

Measurement — Equivalent Units

Volume	Distance
1 liter (L) = 1,000 milliliters (mL)	1 foot (ft) = 12 inches (in.)
Weight	1 yard (yd) = 3 feet (ft) = 36 inches (in.)
1 kilogram (kg) = 1,000 grams (g)	1 meter (m) = 100 centimeters (cm)
1 pound (lb) = 16 ounces (oz)	1 kilometer (km) = 1,000 meters (m)
Time	
1 hour (hr) = 60 minutes (min)	1 minute (min) = 60 seconds (sec)

Place Value

Whole Numbers

1,	2	7	1,	4	0	5
millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones

The number above is read: one million, two hundred seventy-one thousand, four hundred five.

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Decimals

1	7	8	.	6	4
hundreds	tens	ones	⇧ decimal point	tenths	hundredths

The number above is read: one hundred seventy-eight and sixty-four hundredths.

Rounding Numbers Using Place Value

1. Identify the greatest place value: What is the greatest place value in the number?

Thousands 3,421 This number is between 3,000 and 4,000.

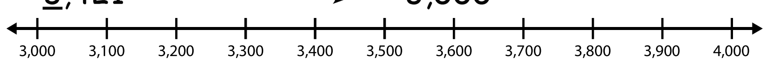
Hundreds 789 This number is between 700 and 800.

Tens 23 This number is between 20 and 30.

2. Round to that place value. Is the number closer to _____ or _____?

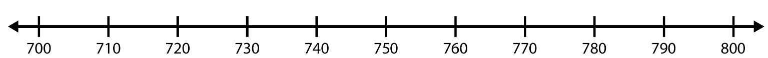
3,421 ⟶ 3,000

Is 3,421 closer to 3,000 or 4,000?



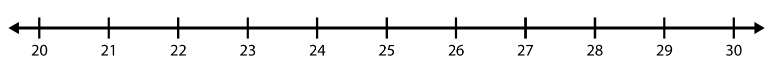
789 ⟶ 800

Is 789 closer to 700 or 800?



23 ⟶ 20

Is 23 closer to 20 or 30?



3. If the number is right in the middle, round up.

8,500 ⟶ 9,000
450 ⟶ 500
65 ⟶ 70

4. Round 48,695 to the nearest thousand.
   - What number is in the thousands place? (8)
   - 48,695 is between 48,000 and 49,000.
   - 48,695 is closer to 49,000 than it is to 48,000.

5. Round 441 to the nearest ten.
   - What number is in the tens place? (4)
   - 441 is between 440 and 450.
   - 441 is closer to 440 than it is to 450.

Help Pages

Solved Examples

Whole Numbers - Rounding to Any Place Value

When we **round numbers**, we are estimating them. This means we focus on a particular place value and decide if that digit is closer to the next highest number (round up) or to the next lower number (keep the same). It might be helpful to look at the place value chart on the previous page.

Example: Round 4,826 to the hundreds place.

4,826

rounding place

4,826

Since 2 is less than 5, the rounding place stays the same.

4,**800**

1. Identify the place that you want to round to. What number is in that place? (8)
2. Look at the digit to its right.
3. If this digit is 5 or greater, increase the number in the rounding place by 1. (round up) If the digit is less than 5, keep the number in the rounding place the same.
4. Replace all digits to the right of the rounding place with zeros.

Example: Round 27,934 to the thousands place.

27,934 ⟶ 7 is in the rounding place.

27,934 ⟶ 9 is greater than 5, so the rounding place will go up by 1.

28,000 ⟶ The digits to the right of the rounding place are changed to zeros.

Whole Numbers - Addition and Subtraction

When adding or subtracting whole numbers, first the numbers must be lined up on the right. Starting with the ones place, add (or subtract) the numbers; when adding, if the answer has 2 digits, write the ones digit and regroup the tens digit (for subtraction, it may also be necessary to regroup first). Then, add (or subtract) the numbers in the tens place. Continue with the hundreds, etc.

Look at these examples of addition.

Examples: Find the sum of 314 and 12.

$$\begin{array}{r} 314 \\ +\ 12 \\ \hline 326 \end{array}$$

Add 6,478 and 1,843.

$$\begin{array}{r} {\scriptstyle 1\ 1\ 1\ } \\ 6{,}478 \\ +1{,}843 \\ \hline 8{,}321 \end{array}$$

1. Line up the numbers on the right.
2. Beginning with the ones place, add. Regroup if necessary.
3. Repeat with the tens place.
4. Continue this process with the hundreds place, etc.

Help Pages

Solved Examples

Whole Numbers - Addition and Subtraction (continued)

Use the following examples of subtraction to help you.

Example: Subtract 37 from 93.

$$\begin{array}{r} \overset{8}{\cancel{9}}\;\overset{13}{\cancel{3}} \\ -\;3\;\;7 \\ \hline 5\;\;6 \end{array}$$

1. Begin with the ones place. Check to see if you need to regroup. Since 7 is larger than 3, you must regroup to 8 tens and 13 ones.
2. Now look at the tens place. Since 3 is less than 8, you do not need to regroup.
3. Subtract each place value beginning with the ones.

Example: Find the difference of 4,125 and 2,033.

$$\begin{array}{r} 4,\overset{0}{\cancel{1}}\;\overset{12}{\cancel{2}}\;5 \\ -\;2,0\;3\;3 \\ \hline 2,0\;9\;2 \end{array}$$

1. Begin with the ones place. Check to see if you need to regroup. Since 3 is less than 5, you do not need to regroup.
2. Now look at the tens place. Check to see if you need to regroup. Since 3 is larger than 2, you must regroup to 0 hundreds and 12 tens.
3. Now look at the thousands place. Since 2 is less than 4, you are ready to subtract.
4. Subtract each place value beginning with the ones.

Sometimes when doing subtraction, you must **subtract from zero**. This always requires regrouping. Use the examples below to help you.

Examples: Subtract 2,361 from 5,000.

$$\begin{array}{r} \overset{4}{\cancel{5}},\overset{9}{\cancel{\overset{10}{\cancel{0}}}}\;\overset{9}{\cancel{\overset{10}{\cancel{0}}}}\;\overset{10}{\cancel{0}} \\ -\;2,\;3\;\;6\;\;1 \\ \hline 2,\;6\;\;3\;\;9 \end{array}$$

1. Begin with the ones place. Since 1 is larger than 0, you must regroup. You must continue to the thousands place, and then begin regrouping.
2. Regroup the thousands place to 4 thousands and 10 hundreds.
3. Next regroup the hundreds place to 9 hundreds and 10 tens.
4. Then, regroup the tens place to 9 tens and 10 ones.
5. Finally, subtract each place value beginning with the ones.

Find the difference between 600 and 238.

$$\begin{array}{r} \overset{5}{\cancel{6}}\;\overset{9}{\cancel{\overset{10}{\cancel{0}}}}\;\overset{10}{\cancel{0}} \\ -\;2\;\;3\;\;8 \\ \hline 3\;\;6\;\;2 \end{array}$$

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Whole Numbers - Multiplication Table of Basic Facts

It is very important that you memorize your **multiplication facts**. This table will help you as you memorize them!

To use this table, choose a number in the top gray box and multiply it by a number in the left gray box. Follow both with your fingers (one down and one across) until they meet. The number in that box is the product.

An example is shown for you: 2 × 3 = 6

×	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
6	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

Help Pages

Solved Examples

Whole Numbers - Multiplication

When multiplying multi-digit whole numbers, it is important to know your multiplication facts. Follow the steps and the examples below.

Here is a way to multiply a four-digit whole number by a one-digit whole number.

Use the **distributive property** to multiply 3,514 x 3.

Multiply 3 by all the values in 3,514 (3,000 + 500 + 10 + 4).

Add all the partial products to get one final product.

```
 1  1
 3,514
 ×   3
------
10,542
```

3 × 4 = 12 ones or 1 ten and 2 ones.

3 × 10 = 3 tens + 1 ten (regrouped) or 4 tens.

3 × 500 = 15 hundreds or 1 thousand and 5 hundreds.

3 × 3,000 = 9 thousands + 1 thousand (regrouped) or 10 thousands.

(3,000 x 3) + (500 x 3) + (10 x 3) + (4 x 3) = 9,000 + 1,500 + 30 + 12 = 10,542

Here are two ways to multiply two two-digit numbers.

Use the **distributive property** to multiply 36 x 12.

Multiply the two addends of 36 (30 + 6) by the two addends of 12 (10 + 2).

Then, add all the partial products to get one final product.

```
  36
× 12
----
 432
```

2 x 6 = 12

2 x 30 = 60

10 x 6 = 60

10 x 30 = 300

(30 x 10) + (30 x 2) + (6 x 10) + (6 x 2) = 300 + 60 + 60 + 12 = 432

Use the **matrix model** to multipy 48 x 31.

The model shows the four parts needed to arrive at the final product.

Place the expanded form of each two-digit number on the outside edge of the boxes as shown.

Write the partial products in each box. The sum of the four partial products is 1,488.

Notice the two different addition problems that serve as a way to check your accuracy.

	40	8	
30	1,200	240	1,440
1	40	8	+ 48
	1,240 +	248	1,488

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Solved Examples

Factors and Multiples

In the basic fact 2 × 3 = 6, 2 and 3 are called **factors,** and the **product** is 6.

To name all the **factor pairs** of 20, think of every factor pair that will result in a product of 20 (1 x 20, 2 x 10, 4 x 5). Then list those factors from smallest to largest (1, 2, 4, 5, 10, and 20).

A **multiple** is the product of two whole numbers. When you skip count by twos, you say the multiples of two. The first five multiples of 2 are 2, 4, 6, 8, and 10.

Prime and Composite

Prime Numbers: A prime number is a number greater than 1 that has only two factors, 1 and itself. 2 and 7 are prime numbers: 2 × 1 = 2; 7 × 1 = 7.

Composite Numbers: A composite number has more than two factors. 12 is a composite number with 6 factors: 1, 2, 3, 4, 6, 12.

Division – Place value model

Example: Solve. 8,524 ÷ 4

1. Expand the dividend and write it in the place value model. 8,524 = 8,000 + 500 + 20 + 4
   The dotted box is for a remainder.
2. Put the divisor in front of the model.

4	8,000	500	20	4	

3. Divide 4 into each place value.

- How many 4s are in 8,000? (2,000 x 4 = 8,000)

	2,000				
4	8,000	500	20	4	

- How many 4s are in 500? (125 x 4 = 500)

	2,000	125			
4	8,000	500	20	4	

- How many 4s are in 20? (5 x 4 = 20)

	2,000	125	5		
4	8,000	500	20	4	

- How many 4s are in 4? (1 x 4 = 4)

	2,000	125	5	1	
4	8,000	500	20	4	

4. Record the partial quotients.
5. Add the numbers in step 4 to find the final quotient.

$$\begin{array}{r} 2{,}000 \\ 125 \\ 5 \\ +\ 1 \\ \hline 2{,}131 \end{array}$$

8,524 ÷ 4 = 2,131. There is no remainder.

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Solved Examples

Division - Whole Numbers

Example: Divide 9,603 by 4.

1. There are 2000 fours in 9,603.
   The 2 is in the thousands place.
2. 2000 times four equals 8,000.
   9,603 minus 8,000 equals 1,603.

```
      2              2
  4)9,603        4)  9,603
                    −8,000
                     1,603
```

3. There are 400 fours in 1,603.
   The 4 is in the hundreds place.
4. 400 times four equals 1,600.
   1,603 minus 1,600 equals 3.

```
      2 4            2 4
  4)  9,603      4)  9,603
     −8,000         −8,000
       1603          1.603
                    −1,600
                        03
```

5. There are 0 fours in 03.
   The zero is in the tens place.
6. 0 times four equals 0.
   3 minus 0 equals 3.

```
      2 40           2 40
  4)  9,603      4)  9,603
     −8,000         −8,000
      1,603          1,603
     −1,600         −1,600
         03             03
                       −00
                         3
```

7. There are 0 fours in 3.
   The zero is in the ones place.
8. 0 times four equals 0.
   3 minus 0 equals 3.

```
      2,400          2,400
  4)  9,603      4)  9,603
     −8,000         −8,000
      1,603          1,603
     −1,600         −1,600
         03             03
        −00            −00
          3              3
                        −0
                         3
```

The quotient is 2,400, R 3 or 2,400 $\frac{3}{4}$.

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Solved Examples

Fractions - Equivalent Fractions

Equivalent Fractions are 2 fractions that are equal to each other. Usually you will be finding a missing numerator or denominator.

Example: Find a fraction that is equivalent to $\frac{4}{5}$ and has a denominator of 35.

x 7

$\frac{4}{5} = \frac{?}{35}$

x 7

1. Ask yourself, "What did I do to 5 to get 35?" (Multiplied by 7.)
2. Whatever you did in the denominator, you also must do in the numerator. 4 x 7 = 28 The missing numerator is 28.

So, $\frac{4}{5}$ is equivalent to $\frac{28}{35}$.

Example: Find a fraction that is equivalent to $\frac{4}{5}$ and has a numerator of 24.

x 6

$\frac{4}{5} = \frac{24}{?}$

x 6

1. Ask yourself, "What did I do to 4 to get 24?" (Multiplied by 6.)
2. Whatever you did in the numerator, you also must do in the denominator. 5 x 6 = 30 The missing denominator is 30.

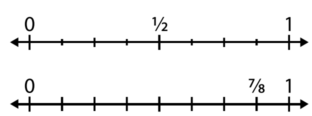
So, $\frac{4}{5}$ is equivalent to $\frac{24}{30}$.

Fractions - Comparing Fractions

When you are given a visual model like a number line to compare two fractions, the fraction that is farthest to the right on the number line is greater.

Example: Choose the sign that makes this sentence true. (< > =) $\frac{1}{2} \bigcirc \frac{7}{8}$

Find the fractions on each number line. The fraction that is farthest to the right is greater.



$\frac{1}{2} < \frac{7}{8}$

When you do not have a number line, think about what you already know.

Example: Choose the sign that makes this sentence true. $\frac{3}{8} \bigcirc \frac{1}{2}$

Think about this: Half of 8 is 4, so $\frac{4}{8}$ equals $\frac{1}{2}$. Which has more eighths, $\frac{3}{8}$ or $\frac{4}{8}$? That will help you know which is greater.

$\frac{3}{8} < \frac{1}{2}$

Example: Choose the sign that makes this sentence true. (< > =) $\frac{5}{6} \bigcirc \frac{2}{6}$

To compare fractions with like denominators, simply compare the numerators.

$\frac{5}{6} > \frac{2}{6}$, because 5 > 2.

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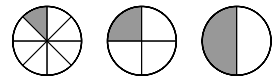
Solved Examples

Fractions (continued)

Compare the unit fractions at the right. Notice that the larger the denominator, the smaller the unit is.



$\frac{1}{8} < \frac{1}{4} < \frac{1}{2}$

Example: Choose the sign that makes this sentence true. (< > =) $\frac{4}{5} \bigcirc \frac{4}{10}$

To compare fractions with like numerators, remember that the larger the denominator, the smaller the unit is.

$\frac{4}{5} > \frac{4}{10}$ This is true because fifths are larger units than tenths are.

Fractions - Decomposing a Fraction or Mixed Number

Decompose (break down into smaller parts) the fraction $\frac{6}{7}$. Show the sum in two different ways.
Here's an example:

$\frac{6}{7} = \frac{5}{7} + \frac{1}{7}$ $\frac{6}{7} = \frac{3}{7} + \frac{3}{7}$

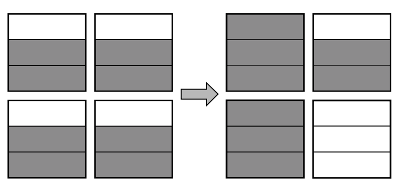
Decompose (break down into smaller parts) the mixed number $2\frac{5}{12}$. Show the sum in two different ways.
Here's an example:

$\frac{29}{12} = 1 + 1 + \frac{5}{12}$ $\frac{29}{12} = \frac{12}{12} + \frac{12}{12} + \frac{2}{12} + \frac{3}{12}$

Fractions Models for Multiplication

Example: Use the fraction model to solve $4 \times \frac{2}{3}$. This fraction model shows $4 \times \frac{2}{3}$.

The first model shows that four groups of $\frac{2}{3}$ is $\frac{8}{3}$.



The second model shows that $\frac{8}{3}$ is equal to the mixed number $2\frac{2}{3}$.

Decimals

All fractions with denominators of 10 and 100 can be written as decimals. The decimal 0.50 can be described as 5 tenths or 50 hundredths.

$$\frac{5}{10} = 0.5$$

$$\frac{50}{100} = 0.50$$

The fraction and decimal below can be decomposed (broken down) into 0.5 $\left(\frac{5}{10}\right)$ + 0.03 $\left(\frac{3}{100}\right)$.

$$\frac{53}{100} = 0.53$$

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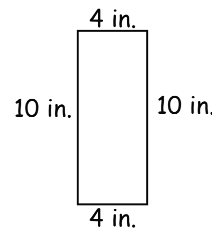
Solved Examples

Rectangles – Perimeter

A rectangle has 2 pairs of parallel sides. The distance around the outside of a rectangle is the perimeter. To find the perimeter of a rectangle, add the lengths of the sides:

Example:

10 + 4 + 10 + 4 = 28 in.
or
2 (10 + 4) = 2 x 14 = 28 in.
or
(2 x 10) + (2 x 4) = 28 in.

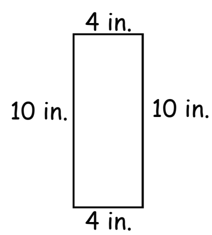


Rectangles – Area

Area is the number of square units within any 2-dimensional shape.

A rectangle has side lengths called length and width. To find the area of a rectangle, multiply the length by the width ($l \times w$).

In the example, 10 x 4 = 40 in.^{2}



Remember to label your answer in square units. Examples:
- square inches: in.^{2}
- square feet: ft^2
- square yards: yd^2
- square miles: mi^2
- square centimeters: cm^2
- square meters: m^2

If the area is known, but the length or width is missing, use division to find the missing measurement.

Example: The area of a rectangle is 70 square inches. The length of one of the sides is 10 inches. Find the width. Label the answer.

If $A = l \times w$, then $A \div w = l$ and $A \div l = w$. Show: 70 ÷ 10 = 7.

The width is 7 inches.

Rectangles – Find the Length and Width

Example: The area of a rectangular sandbox is 18 m^2. The border around the sandbox is 18 m. What are the length and width of the sandbox? Use the factor pairs of 18 to help you find the area of the sandbox first.

In this example, the area and perimeter are clues to the size of the length and width.

The area is 18 m^2. The factor pairs of 18 are 1 x 18, 2 x 9, and 3 x 6. One of those pairs can be the length and width of a rectangle that has a perimeter of 18 m. Use the guess and check strategy to find the right pair.

$$1 + 1 + 18 + 18 \neq 18$$

$$2 + 2 + 9 + 9 \neq 18$$

$$3 + 3 + 6 + 6 = 18$$

The length of the rectangle is 6 m and the width is 3 m.

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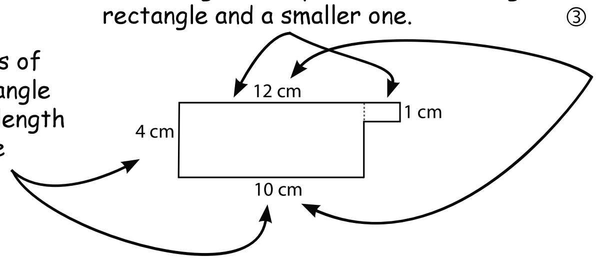
Solved Examples

Rectangles – Find the Area of Irregular Shapes

Example: Find the area of the shape. The dotted line helps to show two different rectangles. Find the area of each rectangle, and then add them together for a total.

① This irregular shape is made of a large rectangle and a smaller one.

② The side lengths of the larger rectangle are clear. The length is 10 cm and the width is 4 cm.



③ The small rectangle has a side length of 1 cm, but the other side is not labeled. However, notice that the top side length is 12 cm and the bottom one is 10 cm. By subtracting 10 from 12, you can see that the missing length is 2 cm. Use that number to calculate the smaller area.

(4 x 10) large rectangle + (2 x 1) small rectangle = 40 + 2 = 42 cm^2

The total area of the shape is 42 cm^2.

Interpreting Data – Line Plots

On a line plot you can quickly see data. It may be spread out or close together.

Example:

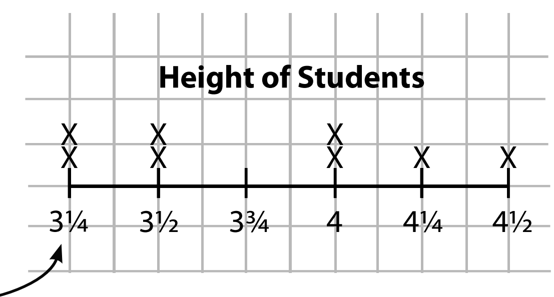
Gary recorded the heights of several students from different grades. Help Gary to organize his data into a line plot.

①To make a line plot, give the line plot a title.

Student	Height (ft.)
Kelly	4
Jerome	3¼
Ming	4½
D'Andre	3½
Kyle	3¼
Maria	4¼
Hector	4
Devin	3½

②Find the greatest value and the lowest value in the set of data.

③ Draw a number line on the grid paper near the bottom. The number line should begin with the lowest value you found.



④ The length of your line should include space to mark from your lowest to your greatest value.

⑤ For each piece of data, draw an "x" above the matching value. An "x" on the line plot will take the place of each number from the data chart. No student names are needed.

What is the difference in height between the second tallest student and the shortest student?

The second tallest student is $4\frac{1}{4}$ ft. The shortest student is $3\frac{1}{4}$ ft.

$$4\frac{1}{4} - 3\frac{1}{4} = 1 \text{ ft}$$

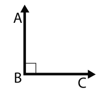
The difference between them is 1 foot.

Help Pages

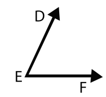
Solved Examples

Geometric Measurement – Angles

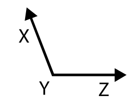
$\angle ABC$ is a **right angle** that measures exactly 90°.



$\angle DEF$ is an **acute angle**. An acute angle measures less than 90°.



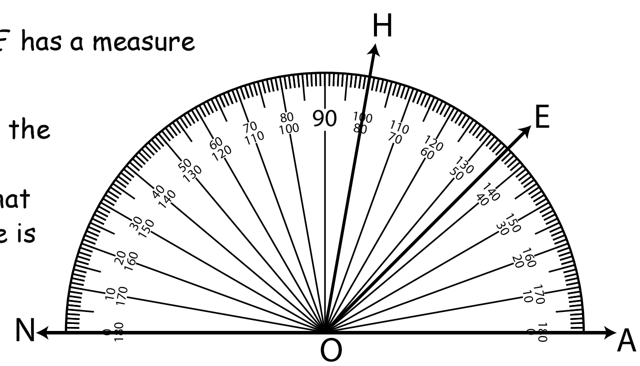
$\angle XYZ$ is an **obtuse angle**. An obtuse angle measures greater than 90° and less than 180°.



Geometric Measurement – Find the Measure of an Angle

To **find the measure of an angle**, a protractor is used.

The symbol for angle is $\angle$. On the diagram, $\angle AOE$ has a measure less than 90°, so it is acute.



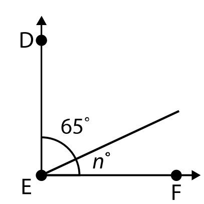
With the center of the protractor on the vertex of the angle (where the 2 rays meet), place one ray ($\overrightarrow{OA}$) on one of the "0" lines. Look at the number that the other ray ($\overrightarrow{OE}$) passes through. Since the angle is acute, use the lower set of numbers. Since $\overrightarrow{OE}$ is halfway between the 40 and the 50, the measure of $\angle AOE$ is 45°. (If it were an obtuse angle, the higher set of numbers would be used.)

Look at $\angle NOH$ It is an obtuse angle, so the higher set of numbers will be used. Notice that $\overrightarrow{ON}$ is on the "0" line. $\overrightarrow{OH}$ passes through the 100 mark. So the measure of $\angle NOH$ is 100°.

Geometric Measurement – Find the Missing Angle Measure

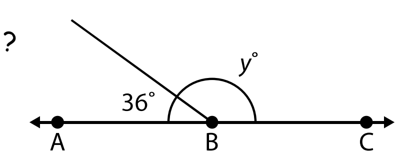
Example: If $\angle DEF$ is a right angle (90°), what is the measure of n ?

In this example, $65 + n = 90$. To find the missing angle measure n, subtract, $90 - 65 = n$. The measure of n is 25°.



Example: If $\angle ABC$ is a straight angle (180°), what is the measure of y ?

In this example, $36 + y = 180$. To find the missing angle measure y, subtract $180 - 36 = y$.
The measure of y is 144°.



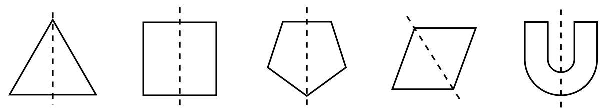
Help Pages

Solved Examples

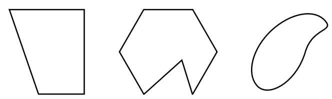
Geometry – Symmetry

A two-dimensional shape has a **line of symmetry** if it can be folded along a line into matching parts.

These shapes have one or more lines of symmetry .



These shapes have no lines of symmetry.



Symbols

The ≈ symbol means "approximately equal to" or "about." This symbol is often used when rounding and estimating.

Here is what the ≈ symbol would look like when rounding to the greatest place value:

34,142 ⟶ 30,000

or

34,142 ≈ 30,000

Say, "34,142 is approximately 30,000" or "34,142 is about 30,000."

157,621 ⟶ 160,000

or

157,621 ≈ 160,000

Say, "157,621 is about 160,000" or "157,621 is approximately 160,000."

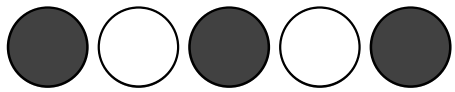
Help Pages

Solved Examples

Describing Patterns

Patterns have shapes, numbers, or other items that either repeat or grow. The "rule" of a pattern describes HOW the pattern continues.

Study the pattern of shapes.



The rule of this pattern is the circles alternate color (gray, white, gray, white, gray).

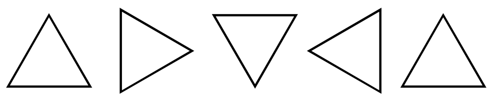
Study the pattern of numbers.

5, 10, 15, 20, 25

The rule of the pattern is "Start at 5 and add 5 each time."

Sometimes the pattern is easy to see, but the rule is harder to describe.

Here is a pattern of triangles.



The rule of the pattern is that the triangle rotates clockwise, 90 degrees each time.

Here is a pattern of numbers.

3, 13, 23, 33, 43

The rule of the pattern is "Start at 3 and add 10 each time."

A "feature" of a pattern is another way to describe the pattern.

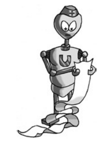
Pattern	Rule	Feature
5, 10, 15, 20, 25	Start at 5; add 5.	All numbers end in 0 or 5.
3, 13, 23, 33, 43	Start at 3; add 10.	All numbers end in 3.
7, 9, 11, 13, 15, 17	Start at 7; add 2.	All numbers are odd.
3, 8, 13, 18, 23, 28	Start at 3; add 5.	All numbers end in 3 or 8.

Help Pages

Problem Solving Strategies

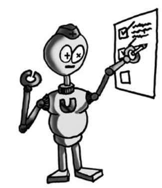
Make an Organized List

An **organized list** of possible answers for a problem uses an order that makes sense to you so that you do not miss any ideas or write the same answer more than once.



Guess and Check

For the **guess and check** strategy, take a guess and see if it fits all the clues by checking each one. If it does, you have solved the problem. If it doesn't, keep trying until it works out. One way to know you have the best answer is when your answer fits every clue.

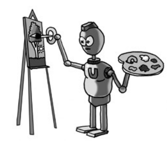


Look for a Pattern

Sometimes math problems ask us to *continue a pattern by writing what comes next*. A **pattern** is an idea that repeats. In order to write what comes next in the pattern, you will first need to study the given information. As you study it, see if there is an idea that repeats.

Draw a Picture

When you **draw a picture** it helps you see the ideas you are trying to understand. The picture makes it easier to understand the words.

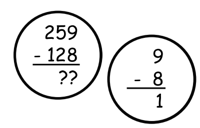


Work Backward

Using this strategy comes in handy when you know the end of a problem and the steps along the way, but you don't know how the problem began. If you start at the end and do the steps in reverse order you will end up at the beginning.

Solve a Simpler Problem

When you read a math problem with ideas that seem too big to understand, try to **solve a simpler problem**. Instead of giving up or skipping that problem, replace the harder numbers with easier ones.

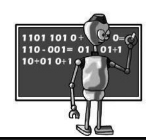


Make a Table

Tables have columns and rows. Labels are helpful too. Writing your ideas in this type of table (or chart) can help you organize the information in a problem so you can find an answer more easily. Sometimes it will make a pattern show up that you did not see before.

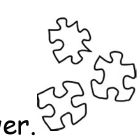
Write a Number Sentence

A **number sentence** is made up of numbers and math symbols (+ − × ÷ > < =). To use this strategy you will turn the words of a problem into numbers and symbols.



Use Logical Reasoning

Logical reasoning is basically common sense. **Logical** means "sensible." **Reasoning** is "a way of thinking." **Logical reasoning** is done one step at a time until you see the whole answer.



Make a Model

A **model** can be a picture you draw, or it can be an object you make or find to **help you understand the words** of a problem. These objects can be coins, paper clips, paper for folding, or cubes.