Lesson . Classwork

WARM-UP

1 Jason thought of a number. Then he multiplied it by 6, divided by 40, added 65, and subtracted 18. In the end, he got 50. What number did Jason think of?

2

A tourist walked a kilometers in 3 days. He walked b kilometers the first day, and c kilometers the second day. How many kilometers did the tourist walk the third day?

Martha found m strawberries in a garden, and Mike found n strawberries. k strawberries were rotten. How many good strawberries did Martha and Mike find?

There were a passengers on a bus. On a bus stop, x passengers got off the bus and y passengers got on the bus. How many passengers were there on the bus?

Mom bought b meters of fabric for her dress. She bought 3 times less fabric for her daughter's dress. How much longer is the mom's piece of fabric than the daughter's?

There were d passengers in the first car of the train, and 12 passengers more in the second car of the train than in the first. What is the difference between the number of the passengers in the first car and the number of passengers in the second car?

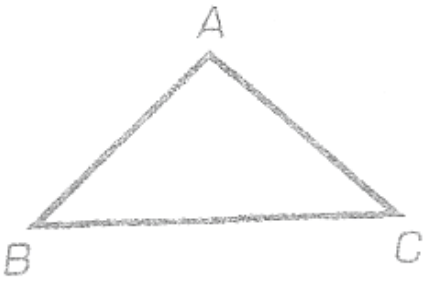
Review

Triangles

How do we call a figure shown on the picture above?

The figure is called a *triangle*, because it has 3 angles.

The segments which construct a triangle are called the sides of a triangle.

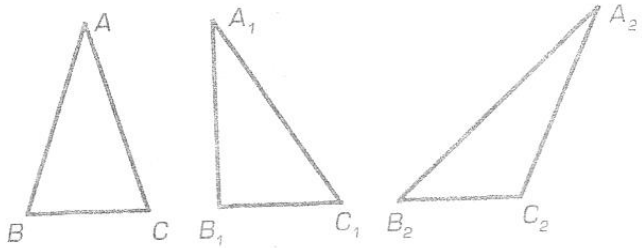


The sum of the sides of a triangle is called a perimeter (the sum of the segments AB + BC + CA).

Classifying types of triangles

Right Triangles

Examine the triangles on the picture below. What is the difference between the triangles on the picture?



One of the angles in is a right angle

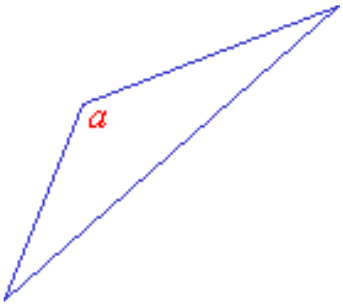
A triangle with a right angle is called a right triangle.

A right triangle is a triangle with a right angle (i.e. 90°).

You may have noticed that the side opposite the right angle is always the triangle's longest side. It is called the **hypotenuse** of the triangle. The other two sides are called the **legs**.

Obtuse Triangles

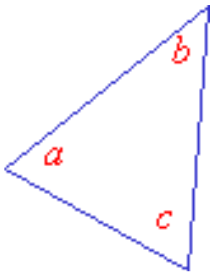
An obtuse triangle has one obtuse angle (i.e. greater than 90º). The longest side is always opposite the obtuse angle. In the obtuse triangle shown below, *a* is the obtuse angle.

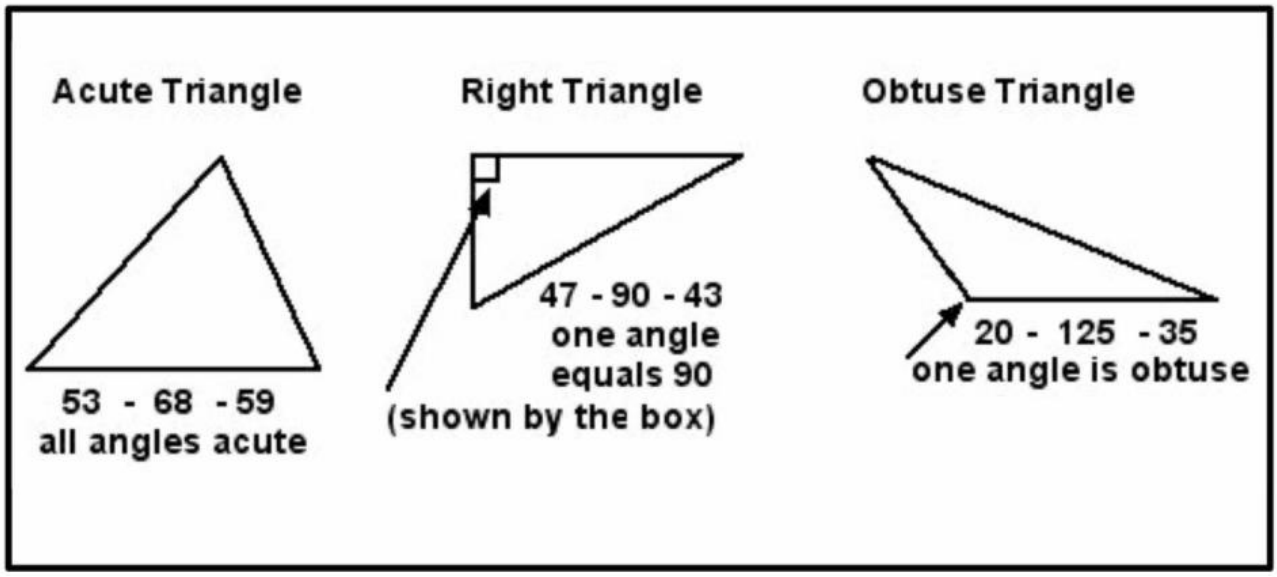


Acute Triangles

An acute triangle is a triangle whose angles are all acute (i.e. less than 90°).

In the acute triangle shown below, *a*, *b* and *c* are all acute angles.



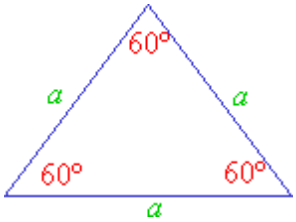


Besides classifying types of triangles according to the size of its angles as above: right triangles, acute triangles and obtuse triangles; types of triangles can also be classified according to the length of its sides.

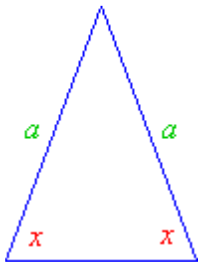
Equilateral Triangles

An equilateral triangle has all three sides equal in length. Its three angles are also equal and they are each 60º.

Isosceles Triangles

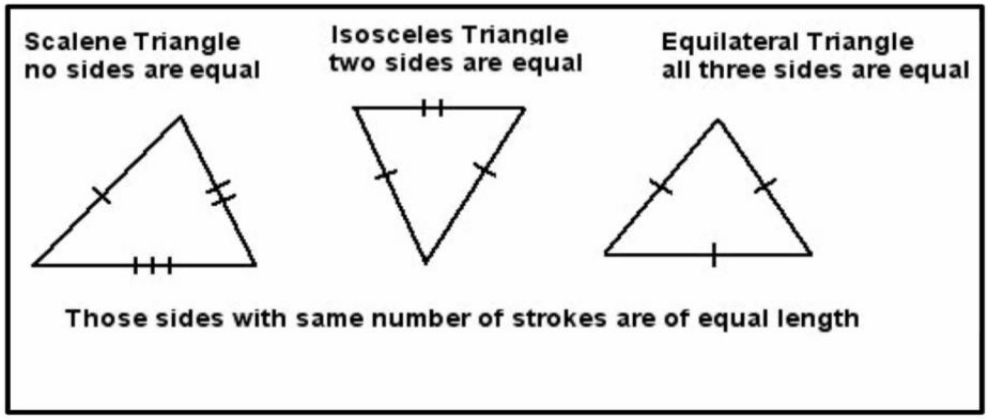


An isosceles triangle has two sides of equal length. The angles opposite the equal sides are also equal.

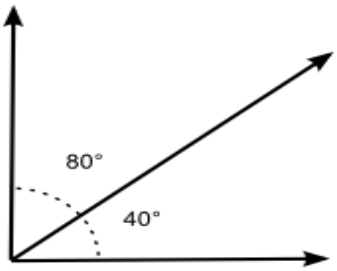


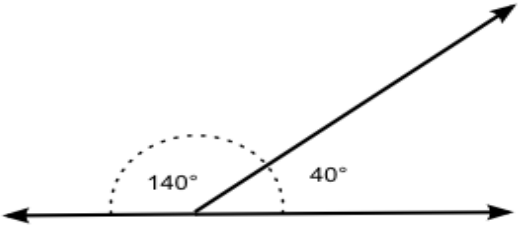
Scalene Triangles

A scalene triangle has no sides of equal length. Its angles are also all different in size.



Two angles are supplementary if their sum is 180° Two angles are complimentary if the sum of their measures is 90º.





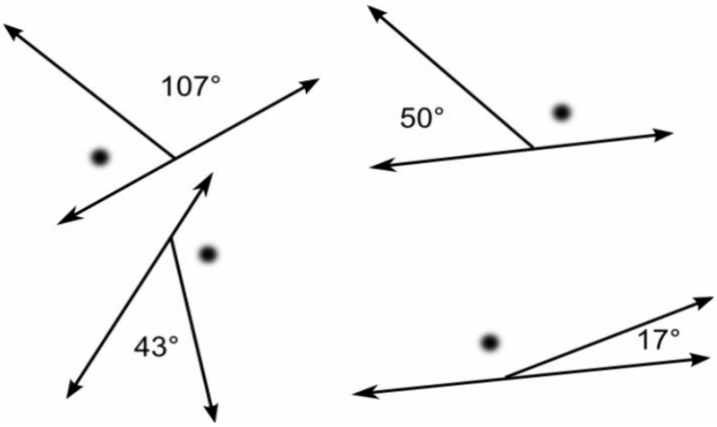
3. Find supplementary angles

x	90°	120°	145°	150°	180°
y					

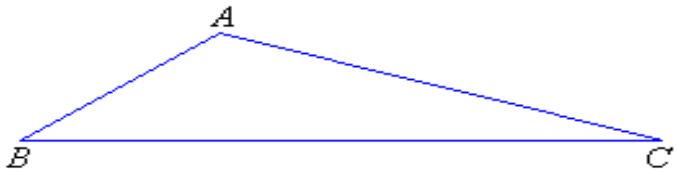
Find complimentary angles

x	15°	30°	45°	60°	75°
y					

Find all missing angles



Angle Sum of a Triangle



Can a triangle have two obtuse angles? Why or why not?

Can a triangle have two right angles? Why or why not? What happens to the sides of two right angles if we extend them?

Compare the sides and the angles of a triangle ABC. Which side is the longest? Which angle is the largest? Which side is the shortest? Which angle is the smallest?

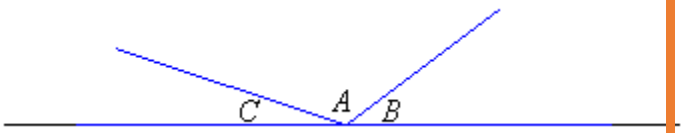
Conclusion: In a triangle, the largest angle lies opposite the longest side. In a triangle the smallest angle lies opposite a shortest side. Also, the opposite is true: the shortest side is across from the smallest angle.

Does any isosceles triangle have two equal angles?

Think! If the angles were not equal then one of the angles would be greater than the other. For example angle ABC would be greater than angle ACB. In a case like this would the sides AB and AC be equal?

1) Draw a triangle *ABC* and cut out the three angles.

2) Rearrange the three angles to form a straight angle on a straight line.

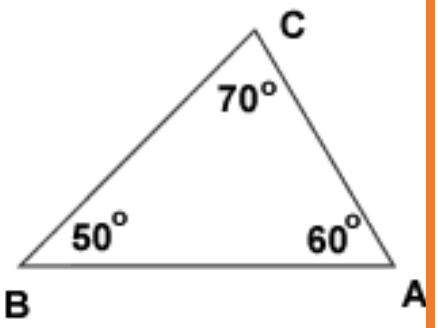


$$\text{Angle } A + \text{Angle } B + \text{Angle } C = 180°$$

So, the angle sum of a triangle is 180°.

Just like regular numbers, angles can be added to obtain a sum. Sometimes, we can determine a missing angle because we know that the sum must be a certain value. Remember -- the sum of the degree measures of angles in any triangle equals 180 degrees.

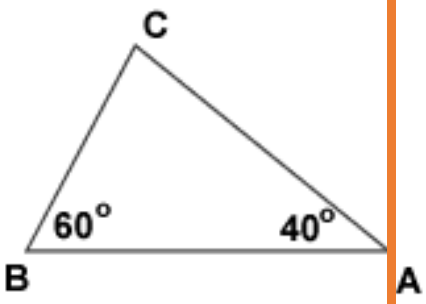
Look at the triangle ABC, where angle A = 60 degrees, angle B = 50 degrees and angle C = 70 degrees.



If we add all three angles in any triangle we get 180 degrees. So, the measure of angle A + angle B + angle C = 180 degrees. This is true for any triangle in the world of geometry. We can use this idea to find the measure of angle(s) where the degree measure is missing or not given.

In triangle ABC below, angle A = 40 degrees and angle B = 60 degrees. What is the measure of angle C?

We know that the sum of the measures of any triangle is 180 degrees. Using the fact that angle A + angle B + angle C = 180 degrees, we can find the measure of angle C.



Angle A = 40 ,

Angle B = 60,

Angle C = we don't know.

To find angle C, we simply plug into the formula above and solve for C.

A + B + C = 180
C = 180 - A - B
C = 180 - 40 - 60
C = 80

To check if 80 degrees is correct, let's add all three angle measures. If we get 180 degrees, then our answer for angle C is right.

Here we go: 40 + 60 + 80 = 180 It works!

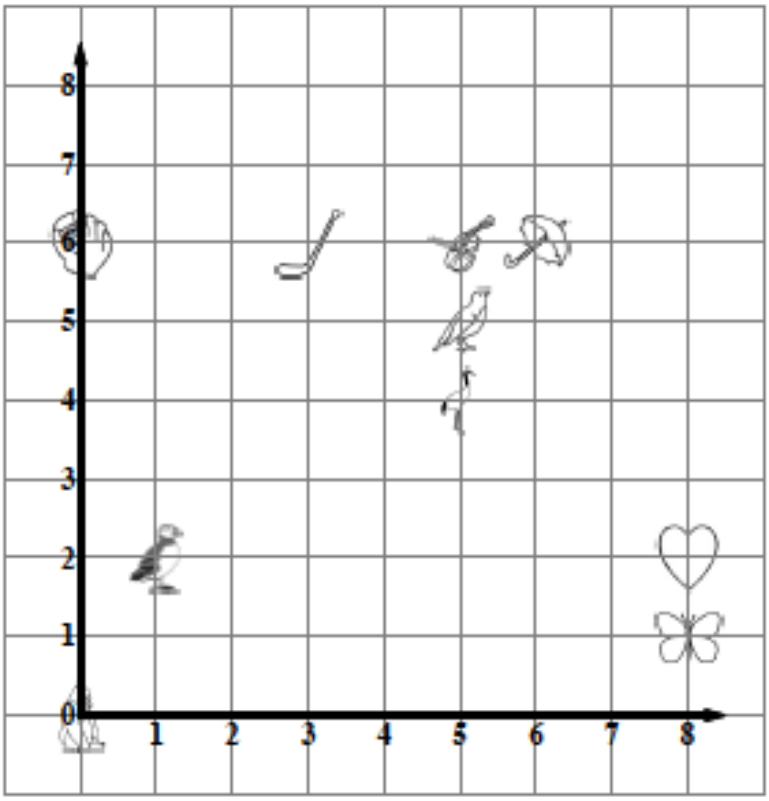
You don't always have to plug in those values to the equation and solve. Once you're comfortable with this sort of problem you'll be able to say "okay, 40 + 60 =100, so the other angle has to be 80!" and it's much quicker.

4. In $\triangle ABC$, $\angle A = 45°$, $\angle B = 90°$, find $\angle C$.

In $\triangle ABC$, $\angle A = 70°$, $\angle B = 30°$, find $\angle C$.

In $\triangle ABC$, $\angle A = 100°$, $\angle B = 50°$, find $\angle C$.

5.



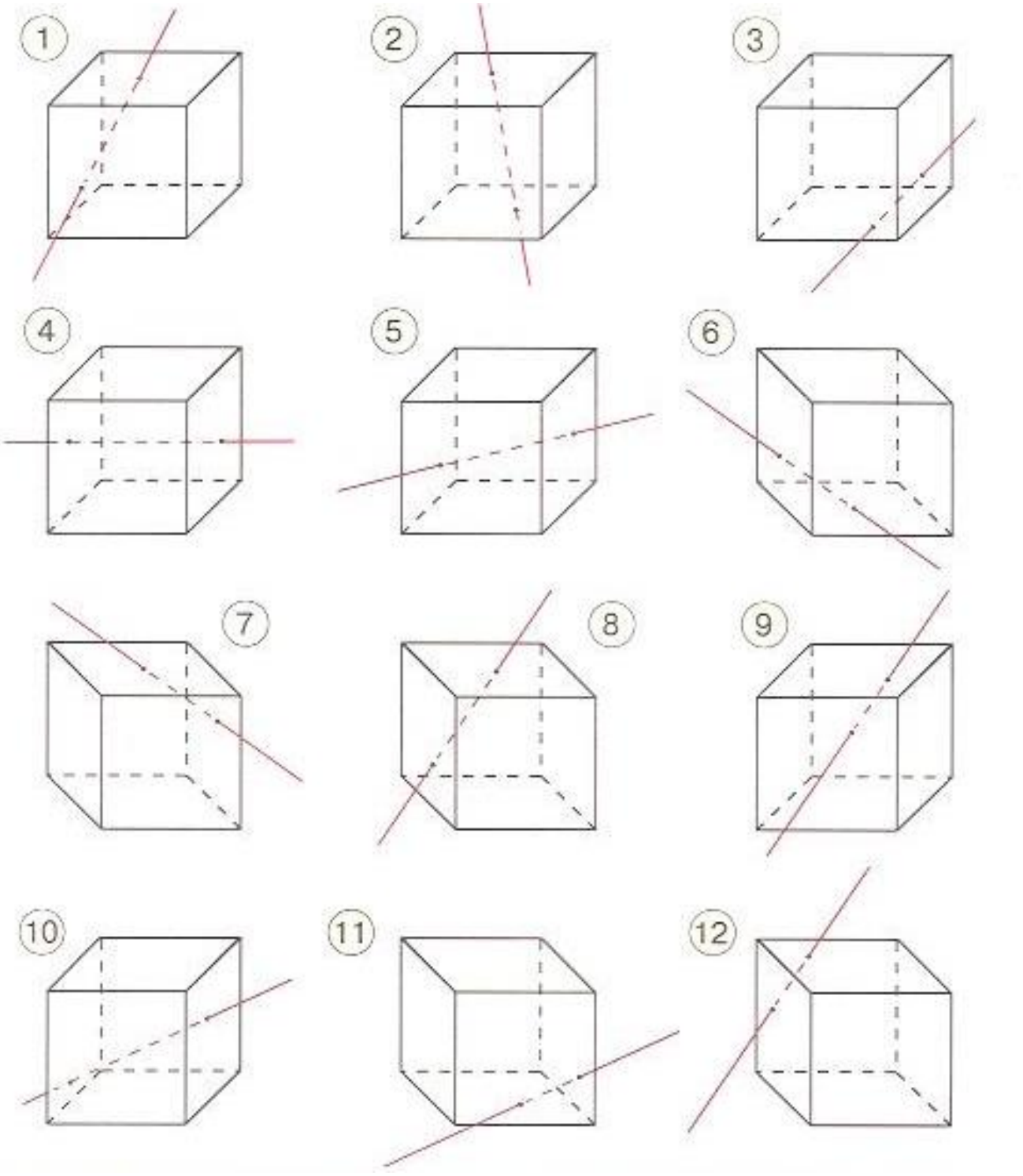
Draw the picture that is at the ordered pair.

1. (0, 2) _____
2. (5, 3) _____
3. (6, 2) _____
4. (3, 2) _____
5. (0, 8) _____
6. (8, 6) _____

Write the ordered pair for the given point.

7.  _____
8.  _____
9.  _____
10.  _____
11.  _____
12.  _____
13.  _____
14.  _____
15.  _____

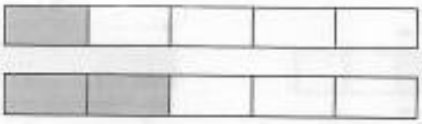
6. Imagine that a cube was pierced by a needle. Color in the sides of the cube that were pierced.



COMPARING AND ORDERING FRACTIONS

To compare fractions, we can draw a diagram.

1. Which is greater, $\frac{1}{5}$ or $\frac{2}{5}$?

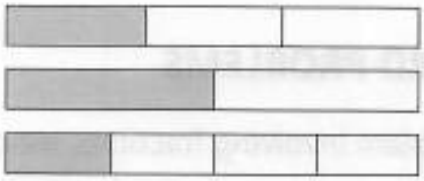


Compare the number of shaded parts.

$\frac{2}{5}$ is greater than $\frac{1}{5}$.

2. Arrange the fractions in order. Begin with the smallest.

$\frac{1}{3}$, $\frac{1}{2}$, $\frac{1}{4}$



Compare the sizes of the shaded parts.

Arrange in order from the smallest: $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$.

ADDITION AND SUBTRACTION OF LIKE FRACTIONS

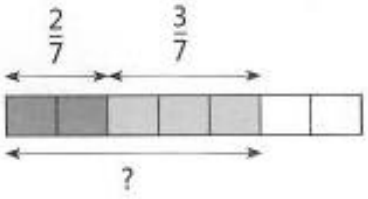
Like fractions Fractions with the same number at the 'bottom'.

$\frac{1}{7}$ and $\frac{3}{7}$ are like fractions.

This 'bottom' number is the same.

To add or subtract like fractions, we add or subtract the 'top' numbers and put the answer over the same 'bottom' number.

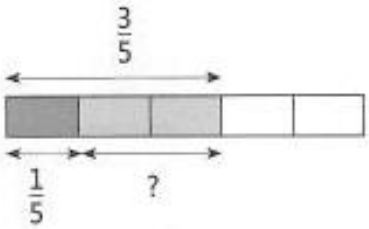
1. What is $\frac{2}{7} + \frac{3}{7}$?



2 sevenths + 3 sevenths
= 5 sevenths

So, $\frac{2}{7} + \frac{3}{7} = \frac{5}{7}$

2. What is $\frac{3}{5} - \frac{1}{5}$?



3 fifths - 1 fifth = 2 fifths

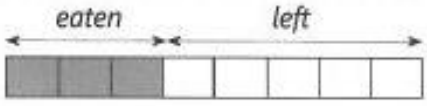
So, $\frac{3}{5} - \frac{1}{5} = \frac{2}{5}$

WORD PROBLEMS

To solve a word problem involving fractions, we can **draw a model**.

Danny cut a cake into 8 equal slices.
He ate 3 slices.

a) What fraction of the cake did he eat?
b) What fraction of the cake was left?



a) He ate $\frac{3}{8}$ of the cake.

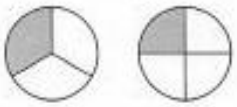
b) $1 - \frac{3}{8} = \frac{5}{8}$

$\frac{5}{8}$ of the cake was left.

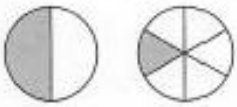
7.

COMPARING AND ORDERING FRACTIONS

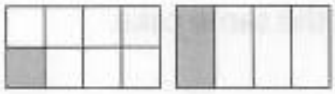
1. Compare the shaded parts. Fill in the blanks with ***greater*** or ***smaller***.

a) 

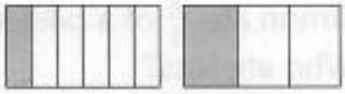
$\frac{1}{3}$ is _____ than $\frac{1}{4}$.

b) 

$\frac{1}{2}$ is _____ than $\frac{1}{6}$.

c) 

$\frac{1}{8}$ is _____ than $\frac{1}{4}$.

d) 

$\frac{1}{6}$ is _____ than $\frac{1}{3}$.

2. Circle the greater fraction.

a) $\frac{1}{5}$ or $\frac{4}{5}$

b) $\frac{1}{2}$ or $\frac{1}{3}$

3. Circle the smaller fraction.

a) $\frac{2}{7}$ or $\frac{4}{7}$

b) $\frac{2}{3}$ or $\frac{2}{7}$

4. Arrange the fractions in order. Begin with the greatest.

a) $\frac{4}{9}, \frac{2}{9}, \frac{7}{9}$

_____

b) $\frac{2}{3}, \frac{2}{5}, \frac{2}{7}$

_____

5. Arrange the fractions in order. Begin with the smallest.

a) $\frac{5}{11}, \frac{5}{7}, \frac{5}{12}$

_____

b) $\frac{1}{10}, \frac{1}{2}, \frac{1}{5}$

_____

8.

6. Jerry ate $\frac{1}{6}$ of a pizza. His sister ate $\frac{2}{6}$ of the same pizza.
Who ate more?

7. Simon ate $\frac{1}{5}$ of a cake. Cathy ate $\frac{1}{3}$ of the same cake.
Who ate less?

8. Aziz painted $\frac{1}{4}$ of a room, Ben painted $\frac{1}{2}$ of the same room and Calvin painted $\frac{1}{6}$ of the same room.
Who painted the most?

9. There were 9 members in a family.
4 of them were not at home.
More than half of the family were not at home. Is this true?

9.

ADDITION AND SUBTRACTION OF LIKE FRACTIONS

1. Add.

a) $\frac{2}{3} + \frac{1}{3} =$ ☐

b) $\frac{1}{5} + \frac{2}{5} =$ ☐

c) $\frac{2}{7} + \frac{3}{7} =$ ☐

d) $\frac{1}{8} + \frac{3}{8} =$ ☐

e) $\frac{3}{9} + \frac{4}{9} =$ ☐

f) $\frac{5}{11} + \frac{4}{11} =$ ☐

g) $\frac{1}{10} + \frac{3}{10} + \frac{4}{10} =$ ☐

h) $\frac{7}{12} + \frac{1}{12} + \frac{4}{12} =$ ☐

2. Subtract.

a) $\frac{2}{3} - \frac{1}{3} =$ ☐

b) $\frac{3}{4} - \frac{1}{4} =$ ☐

c) $\frac{5}{6} - \frac{2}{6} =$ ☐

d) $\frac{9}{10} - \frac{7}{10} =$ ☐

e) $1 - \frac{2}{7} =$ ☐

f) $1 - \frac{5}{11} =$ ☐

g) $1 - \frac{1}{5} - \frac{2}{5} =$ ☐

h) $\frac{10}{11} - \frac{3}{11} - \frac{4}{11} =$ ☐

Write the missing fractions in the boxes.

a) ☐ $+ \frac{1}{3} = 1$

b) $\frac{3}{7} +$ ☐ $= 1$

c) ☐ $+ \frac{2}{9} = \frac{7}{9}$

d) $\frac{1}{8} +$ ☐ $= \frac{5}{8}$

e) ☐ $- \frac{2}{3} = \frac{1}{3}$

f) $\frac{4}{5} -$ ☐ $= \frac{3}{5}$

g) ☐ $- \frac{2}{8} = \frac{3}{8}$

h) $\frac{11}{12} -$ ☐ $= \frac{5}{12}$