# Lesson 7. Classwork

**school nova** ™

**1.** Compare without calculating:

$57 + 29 \square 57 + 30$     $57 - 29 \square 57 - 30$     $58 + 30 \square 59 + 29$

$65 + 18 \square 65 + 20$     $65 + 18 \square 63 + 18$     $65 + 18 \square 64 + 19$

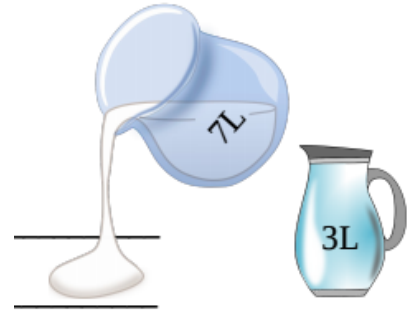$47 + 18 \square 50 + 15$     $47 - 16 \square 47 - 19$     $80 - 19 \square 81 - 20$

**2.** There are two jars: a 7-liter and a 3-liter. Explain the meaning of the following expressions:

$7 + 3$ _____

$7 - 3$ _____

**3.** Continue pattern – add 3 more rectangles.

**4.** Fill in the missing digits:

$$+\begin{array}{r} 8\phantom{0} \\ \phantom{0}5 \\ \hline 9\,7 \end{array} \qquad +\begin{array}{r} \phantom{0}3 \\ 3\phantom{0} \\ \hline 4\,2 \end{array} \qquad +\begin{array}{r} 3\,8 \\ \phantom{00} \\ \hline 9\,8 \end{array} \qquad +\begin{array}{r} \phantom{00} \\ 1\,4 \\ \hline 7\,0 \end{array}$$

## REVIEW

**5.**    **Solve:** Walter had 8 marbles. Then Lamont gave him some more marbles. Walter
has 17    marbles now. How many marbles did Lamont give him?

**Given:** _____

**Problem:** _____

_____

_____

_____          **Answer:** Lamont gave Walter

**6.**

**Solve according to the example above:**

**a)** There are twelve girls in a class of 25 students. How many boys are in the class?

Given:_____

Problem:_____

_____

_____

_____          Answer:_____

**7.**  Express in cm and calculate:

3 dm 7 cm + 5 dm 9 cm = _____

4 dm 2 cm ‑ 2 dm 5 cm = _____

2 dm 6 cm ‑ 19 cm = _____

7m 1dm + 1m 5 cm = _____
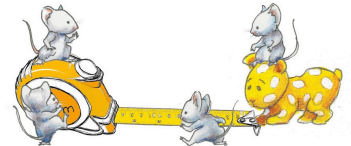
## NEW MATERIAL

## Commutative Property of Addition

Look at the equality:   30-10+5 =

1)  First 30-10, than add 5 =_____

2) First 10-5    , than 30 – result  =_____
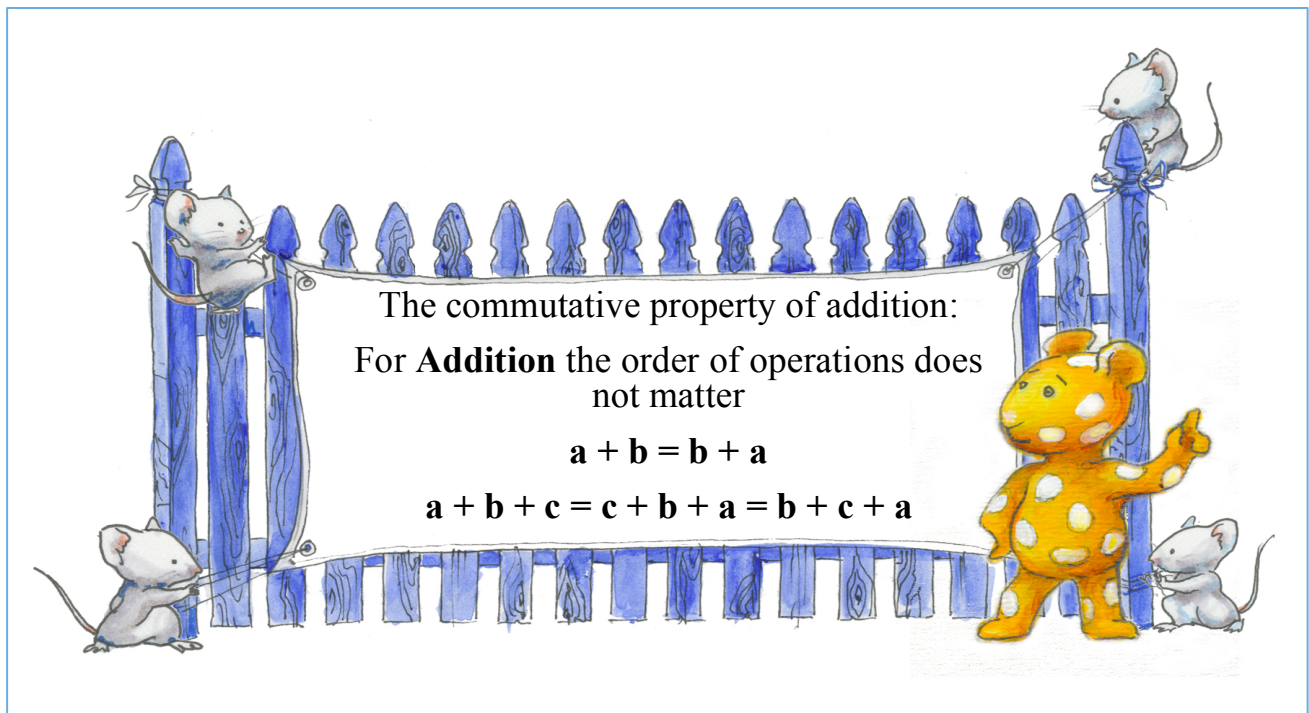
Are the results the same?_____Which is the correct way?_____

Look at the equality:   30+10+5 =

1)  First 30+10, than add 5 =_____

2) First 10+5    , than 30 + result  =_____

Are the results the same?_____Which is the correct way?_____



The commutative property of addition:

For **Addition** the order of operations does not matter

$$a + b = b + a$$

$$a + b + c = c + b + a = b + c + a$$

**8.** Calculate using commutative property of addition:

6 + 15+ 4 = _____=_____                17+7+13+3=_____=_____

2+21+19+8 = _____=_____                1+35+19+5=_____=_____

17+41+3+19 = _____=_____                28+13+12+7=_____=_____

Curves can be "open" and "closed".

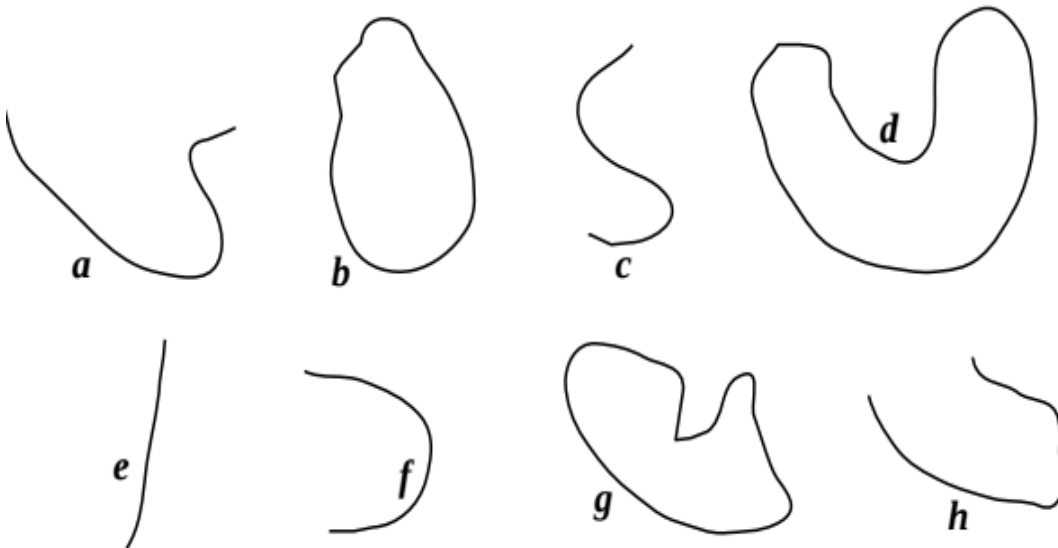Open curve is a curve with end points (in other words, the ends don't join up).
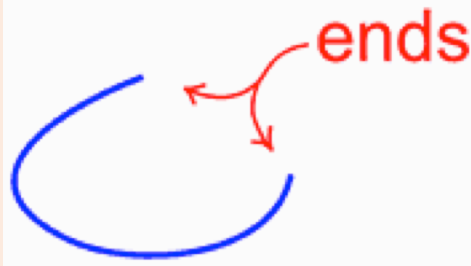


Close curve has no end points.



**8.** Find all closed curves. List all closed curves you found here: _____

 List here all open curves: _____ Using your pencil, make all "open" curves "closed".
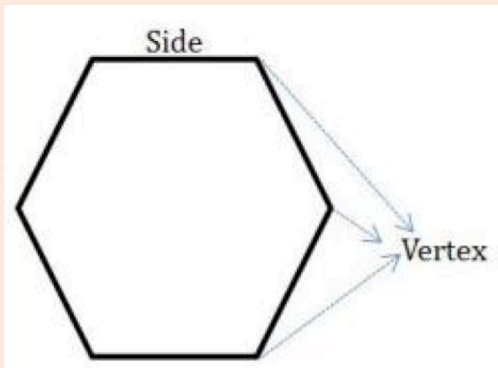
Polygonal chain, shapes.

In geometry, a **polygonal chain** is a connected series of line segments.

Polygonal chain can be "open" or "closed".

If three or more line segments form a closed loop it is called **Polygon.**

- The line segments forming the polygon are called sides.

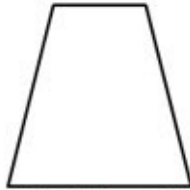- The point of junction of two line segments is called a vertex.

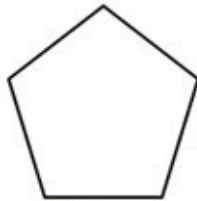Number of vertices of a polygon is equal to the number of line segments or sides.
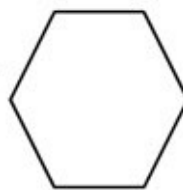


Different types of polygon:



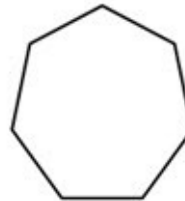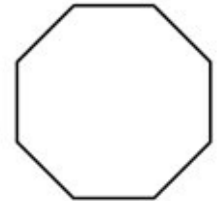| Triangle | Quadrilateral | Pentagon | Hexagon | Heptagon | Octagon |
| --- | --- | --- | --- | --- | --- |
| No. of Sides: 3 | No. of Sides: 4 | No. of Sides: 5 | No. of Sides: 6 | No. of Sides: 7 | No. of Sides: 8 |



Polygon
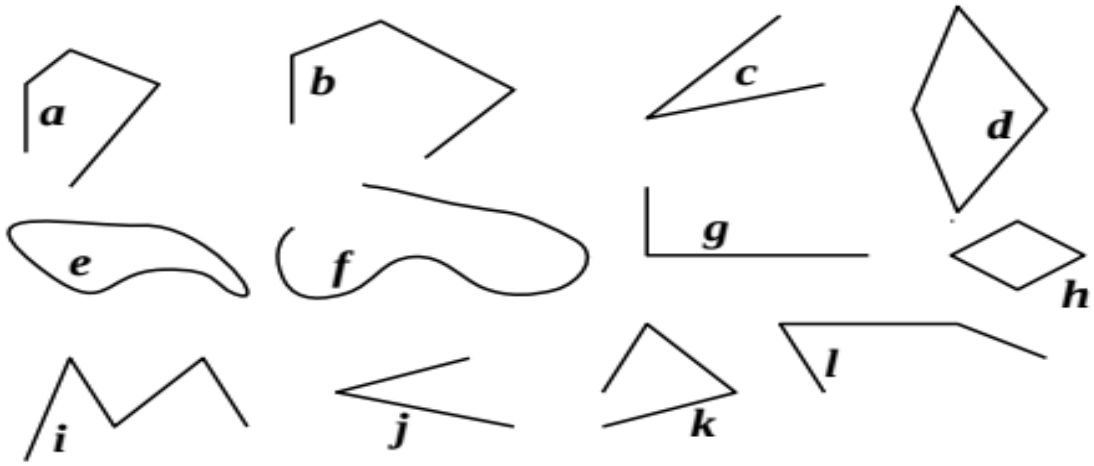
(straight sides)

NOT a Polygon
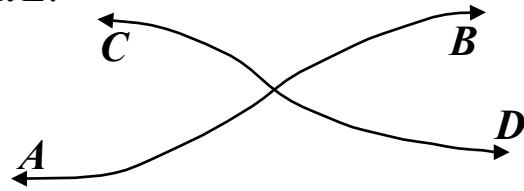
(has a curve)

NOT a Polygon

(open, not closed)

**9.**

Find all curves and list them here: _____

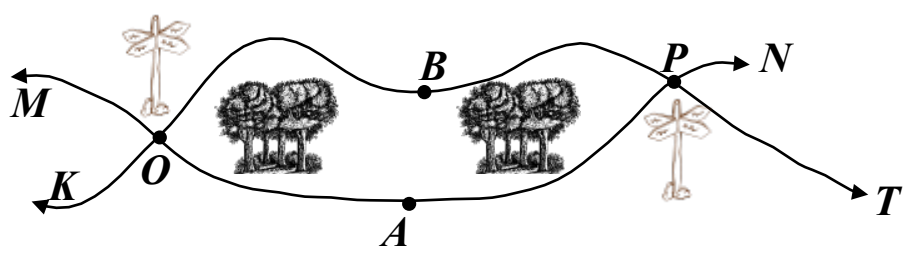Find all open polygonal chains and list them here: _____



**10.**

Find the intersection of curves **AB** and **CD**. Mark the intersection with a point and label it **E**.



**11.**

The routes **KBT** and **MAN** pass through forest.



a) Name the points in which those two routes intersect _____

b) Which intersection point should you pass to get from point **K** to point **M**? _____

c) How many possible routes can you take to get from point **K** to point **N**? _____
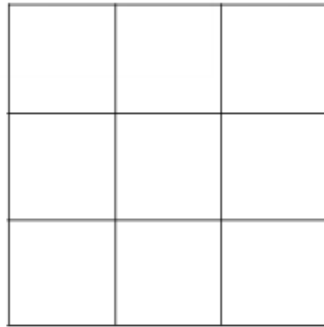
## Challenge yourself
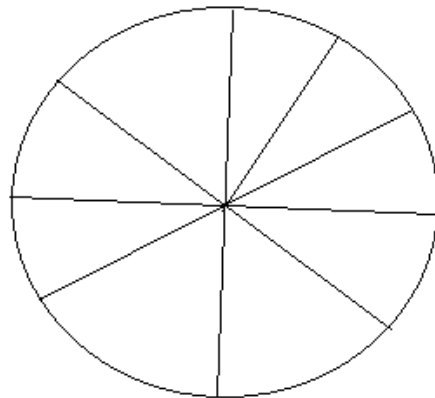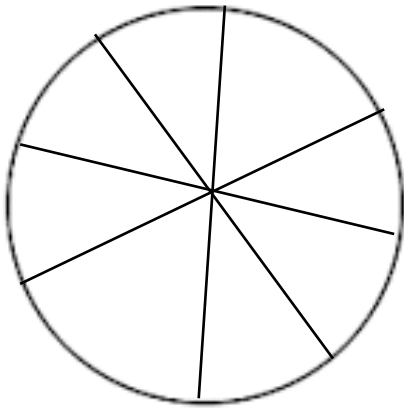
**The Four Colors theorem.**

*There is only one rule: Two regions that share a common edge cannot be colored the same. Having a common corner is OK.*
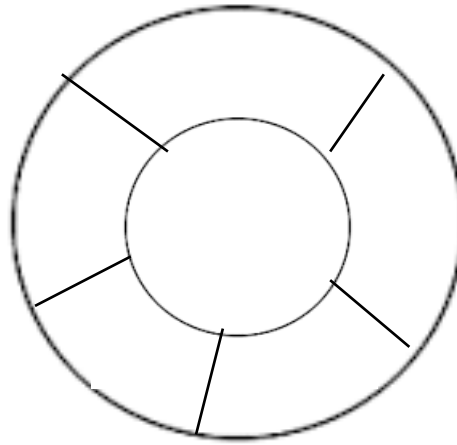
**13.**

a) How many colors do you need to color a pattern of nine squares? Can you color it using only **two colors**?

b) How many colors do you need to color a pie divided into eight pieces? Into nine pieces?

c) How many different colors do you need to color the picture below?



<div style="background-color:#cce0b0; border:1px solid black; text-align:center;">

**Did you know …**

</div>

**The four-color theorem** is one of the simplest mathematical problems to state and understand; still it took mathematicians over 100 years to prove.

The theorem states that if you try to color in a map, you only need **four colors** to complete it so that no two areas touching each other have the same color.

A number of false proofs and false counterexamples have appeared since the first statement of the **four-color theorem** in 1852. ... The **four color theorem** was proved in 1976 by Kenneth Appel and Wolfgang Haken. It was the first major **theorem** to be proved using a computer.

The Four Colour Theorem was the first major theorem to be proved using a computer, having a proof that could not be verified directly by other mathematicians. Despite some worries about this initially, independent verification soon convinced everyone that the Four Colour Theorem had finally been proved. Details of the proof appeared in two articles in 1977.