Math 3 Classwork 14

Test Review

1

Calculate:

1dm 2cm – 7cm + 5dm = ________________________

1dm 4cm + 6cm – 1dm = ________________________

2

Solve for x:

$x - (90 - 64) = 49$

$(27 + 49) - a = 38$

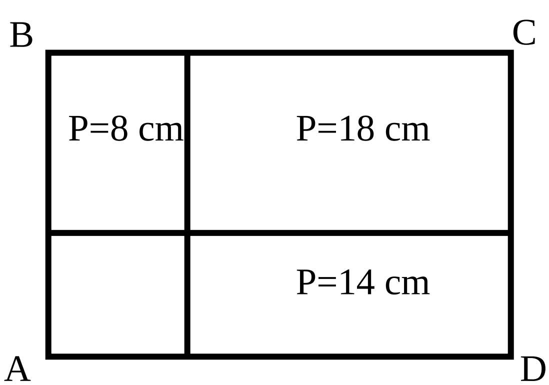
3

The side of an equilateral triangle is 10 cm. Find a perimeter of this triangle.

P = ________________________

4.

Rectangle ABCD is divided into 4 rectangles. Perimeters of 3 rectangles are known and provided on the drawing below. Find the perimeter of the rectangle ABCD if the 4^{th} rectangle is a square.



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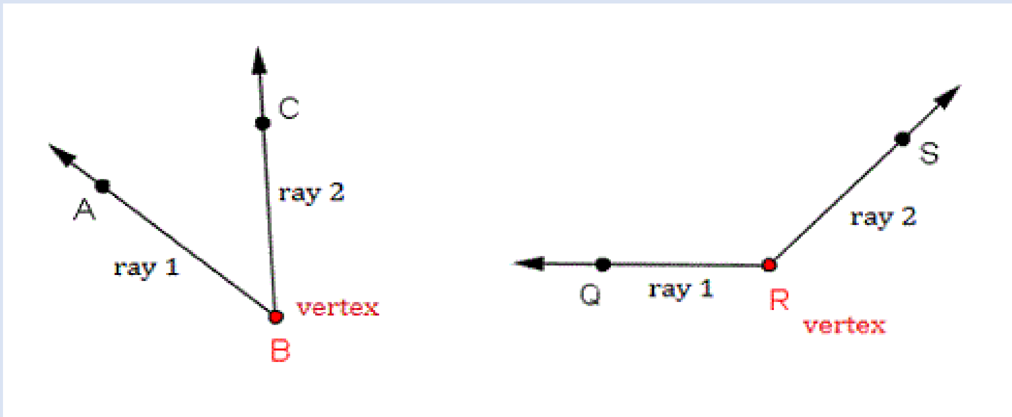
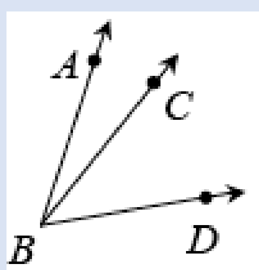
REVIEW I

An angle is formed when two rays meet at a common endpoint. The rays are called the ***sides*** of the angle and their common point is called the ***vertex*** of the angle.



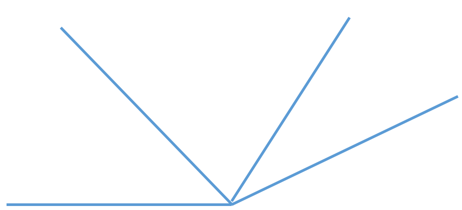
On the pictures above first angle is called the angle B and is denoted as **∠B** or **∠ABC** or **∠CBA** (the vertex is always in the middle). The angle ∠ABC is **an acute angle**.
The second angle is called the angle R and is denoted as **∠R, ∠QRC** or **∠CRQ**. This is an **obtuse angle**.

Adjacent angles: Two **angles** are **Adjacent** when they have a common side and a common vertex (corner point) and don't overlap. In the example at right, ∠ABC and ∠CBD are adjacent angles.

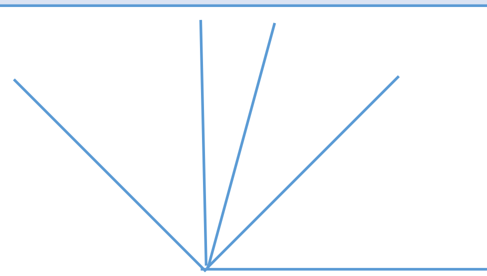


How many angles do you see?

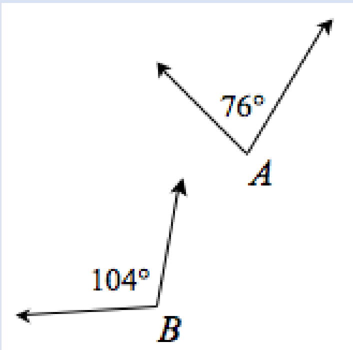
a)

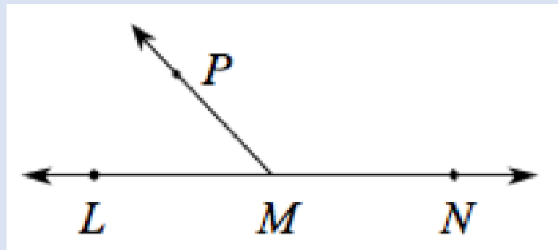


b)



Supplementary angles: Two angles A and B for which A + B = 180°. Each angle is called the supplement of the other. In the example at left, angles A and B are **supplementary**. Supplementary angles are often adjacent. For example, since ∠LMN is a straight angle, then ∠LMP and ∠PMN are supplementary angles because ∠LMP + ∠PMN = 180°.

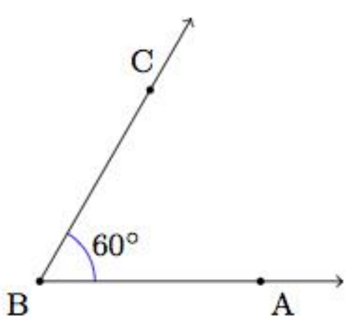


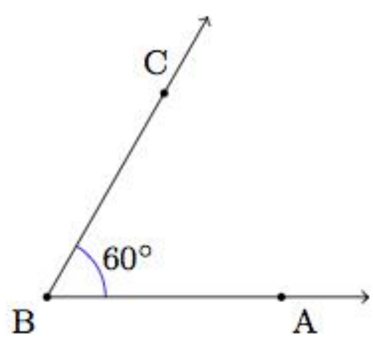


There are 2 supplementary angles. One angle is 43^0. How many degrees are there in the 2^{nd} angle? ______________________

4

Look at the angle that drawn below and measures 60° degrees.





a) Draw another angle that measures 25 degrees. It should have the same vertex and share side $\overrightarrow{BC}$. How many angles are there in the figure you drew? What are their measures?

b) On the copy of your 60-degree angle draw a different angle that measures 45 degrees and has the same vertex and also shares side $\overrightarrow{BC}$. How many angles are there in the figure you drew? What are their measures?

New Material I

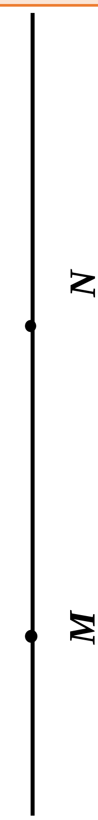
How to find a midpoint between any two points ***A*** and B?
How to find points which are the same distance away from any two points?

Let me introduce to you a “magic” line – every single point on that line will be the same distance away from any two points ***A*** and ***B***.

5

There is a line ***MN*** with points ***M*** and ***N*** on it. A line segment ***MN*** is a part of line ***MN.***

a) Mark any point on the paper and label it ***A***.
b) Draw a circle centered at point ***A*** with a radius equal to length ***MN*** .



c) Mark any point on the circle and label it *B*.
d) Draw another circle centered at point *B* that goes through point *A* (it also should have a radius equal to the length ***MN***)
e) Draw a line segment between points *A* and *B*.
We know that:

- The distance between centers of both circles - points *A* and *B* is equal to the distance between points *M* and *N*.
- All points on the circle centered at a point *A* are at the distance *MN* or at the distance *AB* away from a point *A*.
- All points on the circle centered at a point *B* are at the distance *MN* or at the distance *BA* from a point *B*.

Our two circles intersect in 2 points. Let’s name them *C* and *D*. What can you say about those two points?
Line ***CD*** is our “magic” line - every single point on that line will be at the same distance away from both points ***A*** and ***B.*** Choose any points on that line and use a compass to check this statement.

6.

Use a sketch from the problem #5.

a) Using a ruler, connect points ***A*** and ***B*** (centers of two circles you draw). Label the point of intersection of two lines – ***AB*** and ***CD*** by point ***O***.

b) You should get four triangles. Write down their names: ________________________________

c) Look at the angles $\angle AOC, \angle COB, \angle BOD \text{ and } \angle DOA$. What can you tell about these angles?

d) What are their measures?

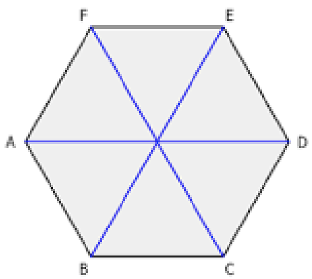
e) Write down all pairs of adjacent angles ____________________________

f) Write down all pairs of supplementary angles ______________________

REVIEW I

7

Let’s learn how to build a symmetrical hexagon using a compass and a straight edge only!



a) Use a compass to draw a circle centered at a given point **A** and passing through another point **B** (choose your own compass opening).

b) Place your compass with the same radius setting at the point **B** and make a mark on a circle on either side of point **B.** Mark this point with a letter **C**

c) Place your compass with the same radius setting at the point **C** and make a mark on a circle going in the same direction as you did in step b). Mark this point with a letter **D.**

d) Repeat step c) three more times or until you will come back to a point **B.**

e) Take a straight edge and connect each point with two neighboring points.

f) Using a straight edge connect each point with a center of your initial circle – point **A.**

● **A**

Questions:

1. If we set the distance between point A (center of the circle) and point B to be 1 unit, what is the distance AC? _____AD? _____.
2. What can you tell about the 6 angles, between segments connecting center of the circle A with points B, C, D, E, F, G – $\angle$ BAC, $\angle$ CAD, $\angle$ DAE, $\angle$ EAF, $\angle$ FAG and $\angle$ GAB?
3. Can you tell the measure of each angle in degrees, if we know that the full angle is 360°?

8

Multiply:

824 × 62 = 436 × 36 = 517 × 74 =

9

Write down the proper names:

AN is a ________________

LM is a ________________

KC is a ________________

DJ is a ________________

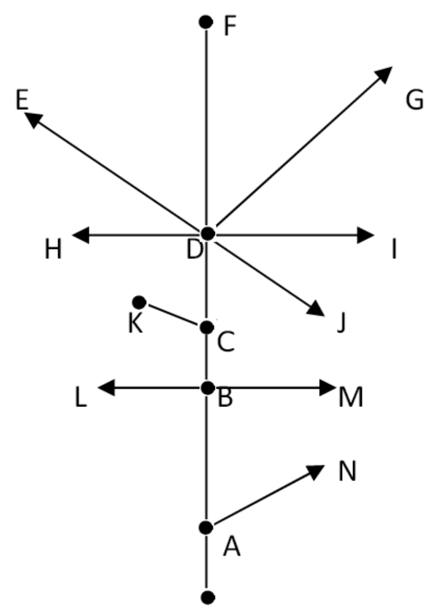
HI is a ________________

DG is a ________________

AF is a ________________

DH is a ________________

AD is a ________________



Did you Know …?

Like many interesting shapes, circles are all around us every day. But how often do you notice them? Circles have fascinated people throughout the ages, so let's explore some of the most famous and mysterious circles in history.

In Ancient Greek culture, the circle was thought of as the perfect shape. Can you guess why? How many lines of symmetry does a circle have, for instance? To the Greeks, the circle was a symbol of divine symmetry and balance in nature. Greek mathematicians were fascinated by the geometry of circles and explored their properties for centuries.
The study of the circle goes back beyond recorded history. The invention of the wheel is a fundamental discovery of the properties of a circle. The Greeks considered the Egyptians as the inventors of geometry.

There are many puzzles based on circles. One mystery that the Greeks could never solve and that no one has ever solved since is called 'Squaring the circle.' The challenge was to construct a square with exactly the same area as a given circle, using only a set of compasses and a straight edge. You weren't allowed to measure or calculate the circle area; you had to do it all by geometrical construction. People have been trying for centuries to solve it, but in 1882 it was proved to be mathematically impossible. For that reason, people who continued to try to solve it were considered to be chasing a dream, and the term *"circle-squarer" became a well-known insult used for someone who attempted the absurdly impossible.*

Circles are still symbolically important today – they are often used to symbolize harmony and unity. For instance, take a look at the Olympic symbol. It has five interlocking rings of different colors, representing the five major continents of the world united together in a spirit of healthy competition.