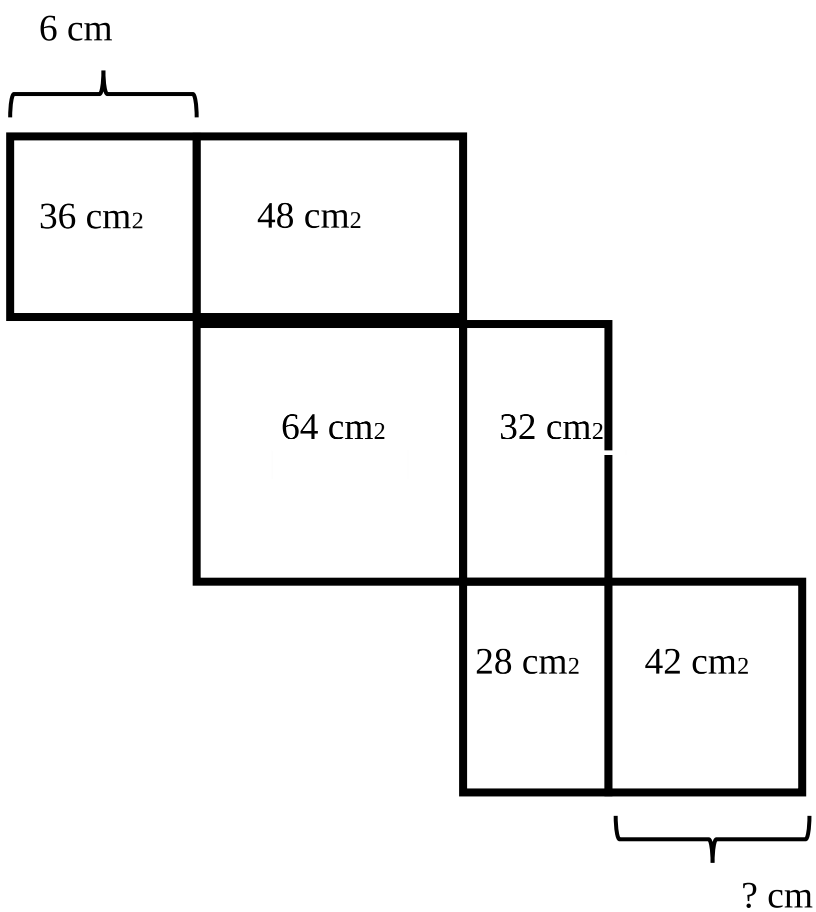
Math 3, Classwork 15

WARM UP

1. Multiplication Gym – 3 minutes

2. Find the length of unknown side. Count in your head.



The side of the last rectangle is _______________ cm

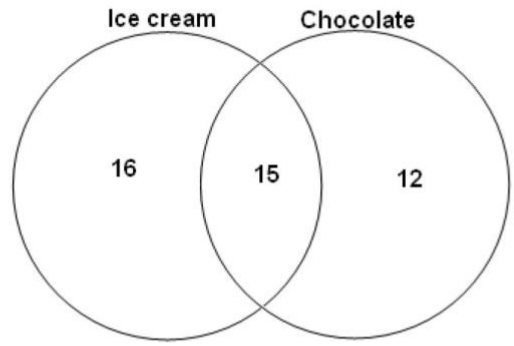
3. Calculate by most optimal way:

95 – 140 + 105 + 240 = _____

210 + 805 – 105 + 90 = _______

Homework REVIEW

4. The number of students who likes ice cream and chocolate are given below:



How many students like ice cream?

Answer: ________________

How many students like chocolate?

Answer: ________________

How many students like both ice cream and chocolate?
Answer: ________________

How many students like only ice cream? Answer: ________________

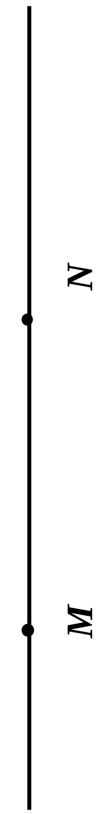
How many students like only chocolate? Answer: ______________________

NEW MATERIAL

5. There is a line ***MN*** with points ***M*** and ***N*** on it. Now we have a line segment ***MN,*** which is a part of line ***MN.***

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

A •



c) Mark a point on the circle and label it ***B***.

d) Draw another circle centered at point ***B*** that goes through point ***A***.

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 a distance ***MN*** or a distance ***AB*** away from a point ***A***.
- All points on the circle centered at a point ***B*** are a distance ***MN*** or a distance ***BA*** from a point ***B***.

Our two circles intersect in 2 points. Lets name them ***C*** and ***D.*** What can you say about those two points?

Let me introduce to you a "magic" line – line ***CD.*** Every single point on that line will be the same distance away from both points ***A*** and ***B***. You can choose a few points and use a compass to check this statement. It will work with circles with any radius as soon as both radii are equal. You will learn how to prove it later.

6.

Using a ruler, connect points A, B and C first and then points A, B and D. What can you say about those 2 triangles? Explain your conjecture.

You have learned how to construct an equilateral triangle using only a compass and straightedge.

REVIEW

7.

Name the set that the following elements belong to.

a) {0, 1, 2, 3, 4, 5, 6, 7, 8, 9} ________________________

b) {0, 2, 4, 6, 8} ___________________________________

c) { a, e, i, o, u} ___________________________________

Fill in blanks with ray/line/line segment in the appropriate places:

8.

AN is a ________________

LM is a ________________

KC is a ________________

DJ is a ________________

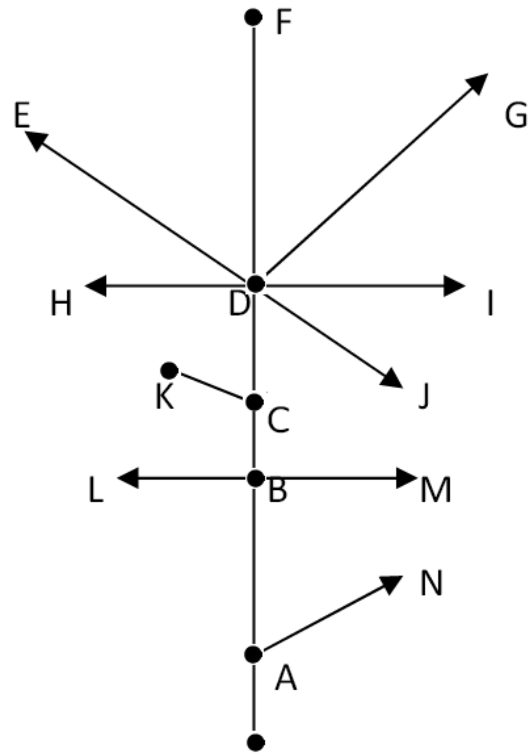
HI is a ________________

DG is a ________________

AF is a ________________

DH is a ________________

AD is a ________________

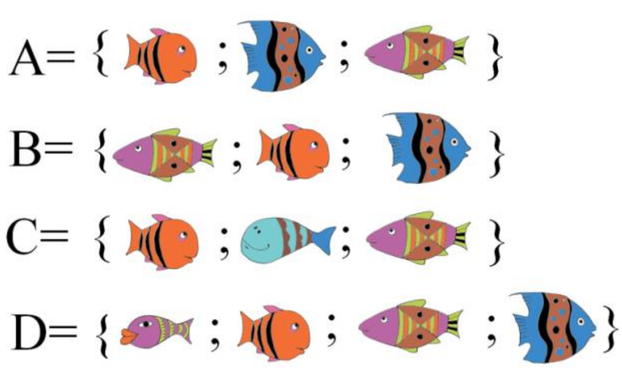


The element can be included in the particular set ONLY if this element has the same property as the other elements of that set.

Two sets are **equal** if they have the same elements. If the sets A and B are equal, we write A=B.

If the sets are not equal, we write A≠B

Example: Let



A=B (they have the same elements)

A≠C

A≠D

B≠C

B≠D

C≠D

9. Set A = {0, 1, 2}. Which of the given sets are equal to A, and which are not. Explain.

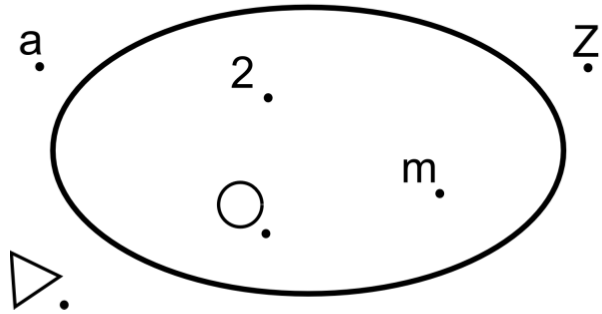
B = {2, 0, 1}, C = {1, 0}, D = {3, 2, 1, 0}.

If the set has no elements then we call it an <u>empty set</u>. An empty set is denoted by Ø.

10. How would you call the following sets?

a) Set of the palm trees growing outside your window? __________
b) Set of six-legged horses? ____________
c) 2-year old children in our class? ______________
d) Crocodiles under our desks? ____________
e) What are the other examples of an empty set you know?______________

11. Look at the drawing. The elements of the set B are ○ {2, ,m,}. Does a number ***2*** belong to this set? A letter ***a***?



A statement «Number *2* belongs to the set ***B***» could be written shorter – like this:

2 $\in$***B***. The symbol $\in$ means «belongs».

A statement «Letter ***a*** does not belong to the set ***B***» could be written like this:

a $\notin$***B***. The symbol $\notin$ means «does not belong.»

12. Let M = {a, b, s, c, o}. What do we write in each case "belong" or "do not belong"?

a . . . . M   ○ . . . . M   c . . . . M
★ . . . . M   △ . . . . M   8 . . . . M

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 think why? How many lines of symmetry does a circle have, for instance? To the Greeks the circle was a symbol of the 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 the recorded history. The invention of the wheel is a fundamental discovery of properties of a circle. The Greeks considered the Egyptians as the inventors of geometry.

There are many puzzles based on circles. One puzzle 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 simply measure or calculate the area of the circle, 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, which represent the five major continents of the world united together in a spirit of healthy competition.