Math 3 Classwork 6

WARM-UP

1 Arrange the numbers from the smallest to the greatest:

a) 8723, 8783, 8328, 8629 _____

b) 2013, 2987, 2897, 2310 _____

2 Write down the expressions and calculate their values:

To the sum of 45 and 36, add 5: _____

To the number 91, add the sum of 9 and 27: _____

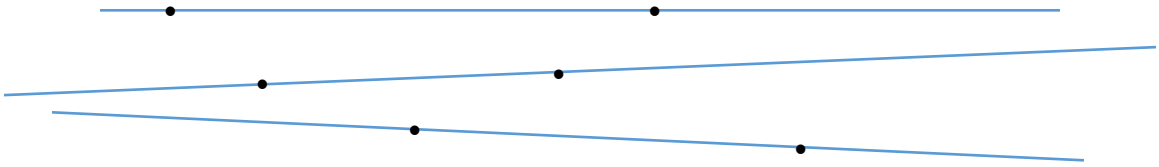
From the sum of 78 and 46, subtract 28: _____

3 Victoria and Julia labeled point A on a number line and wrote 3 **consecutive** numbers each. Victoria wrote: A + 1, A + 2, and A + 4. Julia wrote A – 1, A, and A + 1. Which one of them is right? _____

Homework Review

Problem 1: a) How many points are marked on each line? _____

b) How many points are marked on all 3 lines? _____

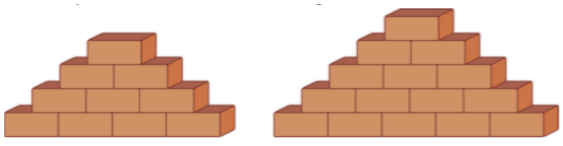


c) Draw 3 straight lines and place 3 points on each line in such a way that you will get 6 points total. *Hint:* lines can intersect.

Problem 2: Answer the following questions:

a) How many more bricks are there in the larger stack? _____

b) How many bricks should be added to the larger stack if you want to add one additional layer of the bricks?_____



New Material I

Mathematical variable is a letter which is used to stand for a number.
The letters x, y, z, a, b, c, m, and n are probably the most commonly used as variables.

The most common use for variables is to represent something that is currently unknown, but that we would like to know

For example, in equation: $5 + \square = 9$

Instead of using an empty box in place of an unknown number you can use a letter, for example letter x.

$$5 + x = 9$$

An equality says that two numbers are equal.

It will have an equal sign " = "

$$2 + 5 = 6 + 1$$

That equality says: what is on the left is equal of what is on the right: (2 + 5) is equal (6 + 1)

If an equality contains one or more variables, it is called equation.

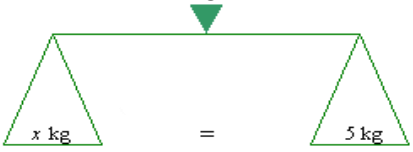
For example, the equation x + 3 = 5, reads "x plus three equals five".

Visualize an equation as a balanced pair of scales.

If you put some weight on the left scale, you should put exactly the same weight on the right scale.

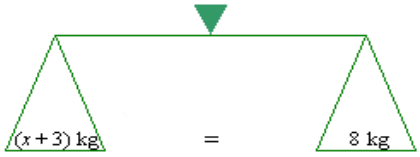
4

a) Consider the simple equation x = 5. In our case x and 5 are measured in kilograms.



b) If we add 3 kg to the left scale, the scales will remain balanced as long as we add 3 kg to the right scale:

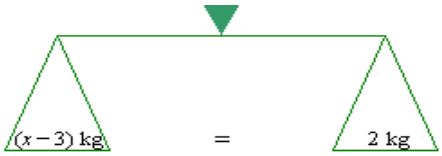
x + 3 = 5 + 3,
x+ 3 = 8



Add 3 kg to both scales

c) If we want to subtract 3 kg from the left scale, the scale will remain balanced as long as we subtract the same weight from the right scale:

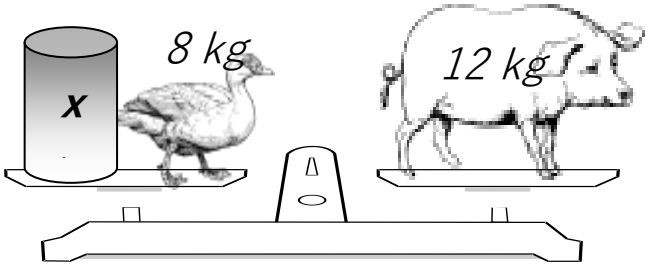
x – 3 = 5 – 3
x – 3 = 2



Subtract 3 kg from both scales

5 Write down an equation and find x

_____
_____
_____



In different problems the same letter **(variable)** can be used represent a different number.
But in each equation a variable stand for a single number!

6 Write down the algebraic expression for each of the following sentences:

The sum of a number and 5 _____

The number minus 4 _____

Six times a number _____

7 Evaluate an expression $(7 + x)$:

If $x = 5$: _____

If $x = 10$: _____

If $x = 120$: _____

8 Simplify the following expressions:

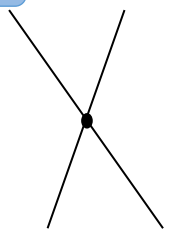
$29 + x + 13 - 29 + 3x =$ _____

$34 + x - 34 - x =$ _____

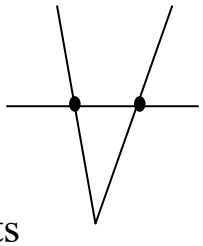
$x + x - x + x - x - x =$ _____

REVIEW

9 a) How many straight lines, rays, and line segments can you find in each figure.



☐ - Straight lines
☐ - Rays
☐ - Line segments



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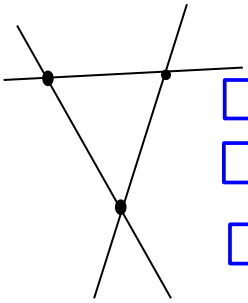

☐ - Straight lines
☐ - Rays
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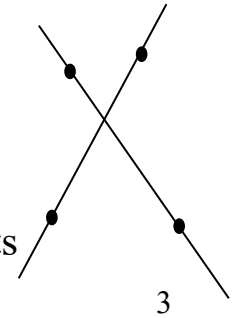


☐ - Straight lines
☐ - Rays
☐ - Line segments

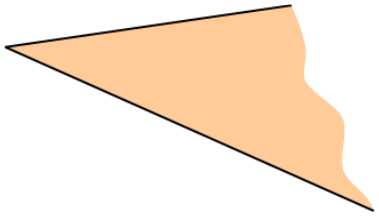
1 Karen, John and Jenny each play one sport: badminton, tennis or football.
Use these clues to decide who plays which sport.

Clue 1: John hits a ball with a racket.
Clue 2: Karen kicks a ball.

	Badminton	*Tennis*	*Football*
Karen			
John			
Jenny			

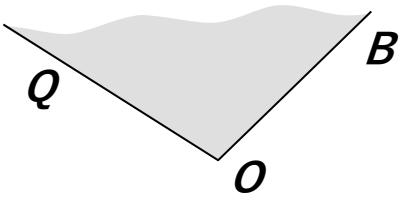
New Material II

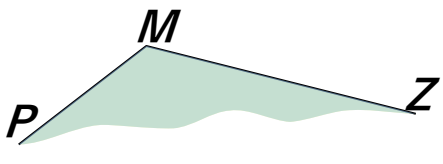
An **angle** is a figure formed by two rays sharing a common end point (vertex).
Every angle divides the plane into two regions: points inside the angle (that is, between the rays) and points outside the angle.

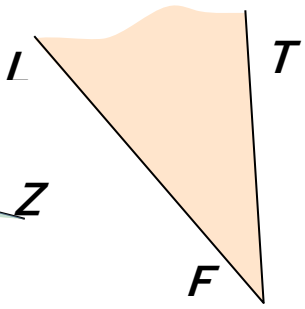


If the vertex of the angle is the point **A** and the two sides are rays **AB** and **AC**, then the angle is denoted **∠BAC, ∠CAB** and sometimes by only one letter - vertex of the angle – **∠A**
The word *angle* comes from the Latin word *angulus,* meaning "a corner."

11 Denote each angle in two different ways.







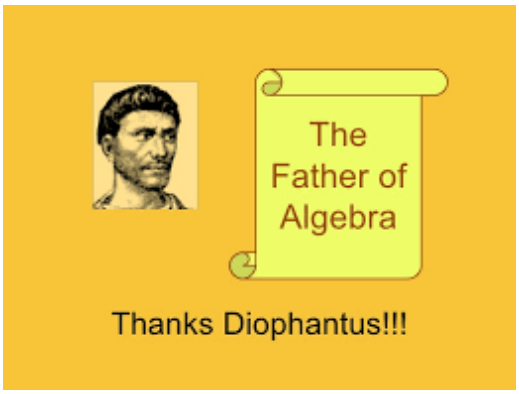
_____ _____ _____

12 Draw two lines $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ that intersect in a point O. How many angles can you see? Can you denote them by only one letter? Name each angle.

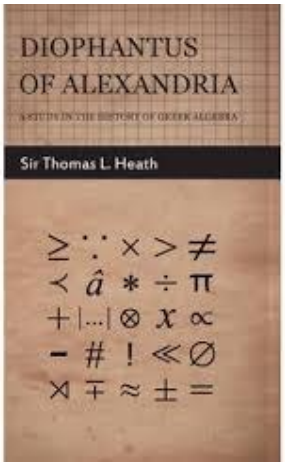
Did you Know …?

The branch of math where you use **symbols**, usually letters of the alphabet, to solve problems is called **Algebra**. These letters, or symbols, are placed in the problem to show an unknown.

The fundamental ideas related to algebra emerged multiple times in different parts of the world and different times.
In ancient times, it was common for discoveries to be made in parallel by different people, as the news was slow to travel.



Ancient Babylon and Egypt are the two places that were at the center of the development of algebra. Both of these civilizations used algebra in different ways and for various reasons. Still, it's generally accepted that it was the Babylonians who first made basic use of algebra and pioneered its beginnings in the field of mathematics. There is evidence of this that dates back as far as 1900 to 1600 BC. The tablet, known as the Plimpton 322 tablet, displays Pythagorean triples and other forms of mathematics.



Greek philosopher Diophantus wrote 13 books on the subject, but only six of them have survived. He was the first person to begin using symbols to represent unknown numbers. Of course, many of the symbols that Hellenistic (Greek) mathematicians that followed Diophantus started to use are not in use today. Things have changed and developed. But what matters most is that the use of symbols was first employed during this period, and this concept has remained, even if the symbols themselves have changed.

In the 17th century, the use of 'x' to represent an unknown variable came into being. Most historians of mathematics now agree that it was Rene Descartes who was responsible for this particular development. It's thought that it was first used in published form in his treatise called La Géométrie, published in 1637. It's a symbol that is still used by mathematicians and students. Descartes began by using a range of letters before eventually selecting x as the most common variable name.