



Central School

Home School Package

Year : 10 Mathematics 2020

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LESSON PLAN

 Teacher	Name : Mrs Henry Subject : Mathematics
 Date	Week : 4 Monday 08/06/20
	Topic : Vectors - Introduction Lesson number : 1
 Learning outcomes	By the end of this lesson, students should be able to: <ul style="list-style-type: none">• Represent position vectors on a grid.• Use vector notation
 Introduction	Definition of a vector A vector is an object that has both a magnitude and a direction. Geometrically, a vector can be pictured as a directed line segment, whose length is the magnitude of the vector and with an arrow indicating the direction. The direction of the vector is from its tail to its head. 



Catch phrase for the lesson

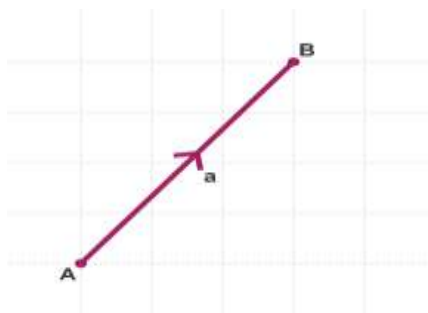
'vectors are essential in [physics](#), [mechanics](#), electrical engineering, and other sciences to describe forces mathematically.'



Learners notes

Summary

A vector between two points A and B is described as: \overrightarrow{AB} , \mathbf{a} or \underline{a} .



When two letters e.g. \overrightarrow{AB} are used to name a vector;

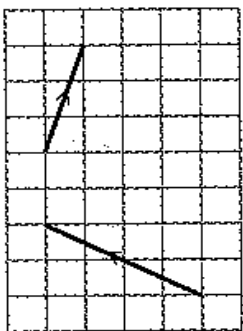


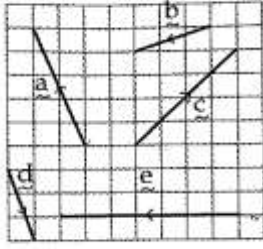
- The first letter gives the starting point
- The second letter gives the end point



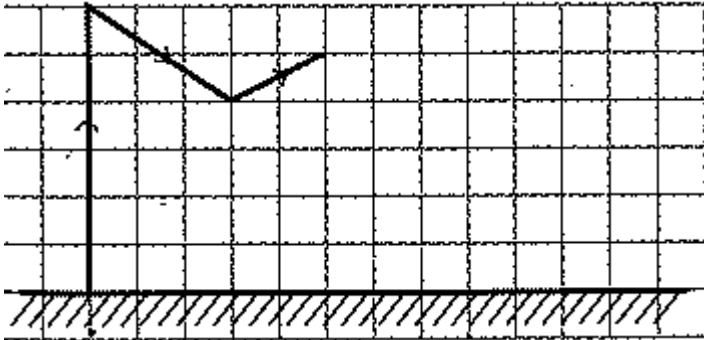

The vector can also be represented by the column

vector $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$. The top number is how many to move in the positive x -direction and the bottom number is how many to move in the positive y -direction.








The table describes the rules for what happens when the numbers in the vector are positive or negative.

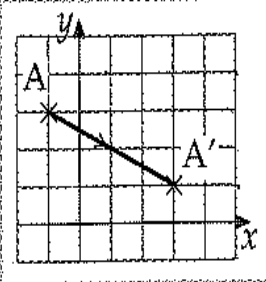


	Positive	Negative
Top number	Move right	Move left
Bottom number	Move up	Move down




	<p>Worked Example:</p> <p>Two examples of column vectors are shown here :</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> $\begin{pmatrix} 1 \\ 3 \end{pmatrix}$ $\begin{pmatrix} -4 \\ 2 \end{pmatrix}$ </div>  </div>
 Visual aids	<p>https://www.youtube.com/watch?v=fNk_zzaMoSs</p> <p>https://www.youtube.com/watch?v=ml4NSzCQobk</p>
 Exercises	<p>Activity</p> <ol style="list-style-type: none"> 1. Read the notes carefully and make your own notes in your math exercise book. 2. Draw these vectors in your exercise book. <div style="display: flex; justify-content: space-around; margin-top: 10px;"> $\underline{a} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$ $\underline{d} = \begin{pmatrix} 0 \\ 2 \end{pmatrix}$ </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> $\underline{b} = \begin{pmatrix} 1 \\ -4 \end{pmatrix}$ $\underline{e} = \begin{pmatrix} -4 \\ -5 \end{pmatrix}$ </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> $\underline{c} = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$ $\underline{f} = \begin{pmatrix} -1 \\ 6 \end{pmatrix}$ </div> 3. <p>Write each of \underline{a} to \underline{e} as column vectors:</p> <div style="display: flex; justify-content: space-between; margin-top: 10px;"> <div> $\underline{a} =$ $\underline{b} =$ $\underline{c} =$ </div> <div> $\underline{d} =$ $\underline{e} =$ </div> </div> <div style="text-align: right; margin-top: 10px;">  </div>

	<p>4. Draw these vectors on the grid in your Math exercise books.</p> <p>(a) $\overrightarrow{CD} = \begin{bmatrix} 2 \\ 3 \end{bmatrix}$ (b) $\overrightarrow{DE} = \begin{pmatrix} 4 \\ -6 \end{pmatrix}$</p> <p>(c) $\overrightarrow{XY} = \begin{pmatrix} -4 \\ 0 \end{pmatrix}$</p>
 Assignment	<p>NOTE :</p> <p>It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.</p>
 Assessment	<p>Q 1 The profile of a warehouse roof can be modelled by a sequence of vectors. Each square in this diagram represents 1 m by 1 m.</p>  <p>(a) The diagram can be completed with 3 vectors so that the profile has an axis of symmetry. Write down the three vectors, in order, to complete the diagram this way.</p> <p>(b) What is the width of the warehouse ?</p>
 References	<p>https://mathinsight.org/vector_introduction</p> <p>https://www.bbc.co.uk/bitesize/guides/z8myrwx/revision/1</p> <p>https://www.amazon.com/Gamma-Mathematics-Homework-Book-Level/dp/0582545188</p>








LESSON PLAN

 Teacher	Name : Mrs Henry Subject : Mathematics
 Date	Week 4 : Tuesday 09/06/20
 	Topic : Vectors – Coordinates Lesson number : 2
 Learning outcomes	By the end of this lesson, students should be able to: <ul style="list-style-type: none"> • Define co-ordinates • Use co-ordinates in vectors
 Introduction	A point on a grid has two numbers to identify its position. These numbers are known as coordinates.
 	Catch phrase for the lesson Vectors and coordinates gives directions to a particular location.
 	Summary <ul style="list-style-type: none"> • Coordinates give the position of points on a graph • Vectors represent a movement from one point to another

<p>Learners notes</p>	<p>Translate the point $A = (-1, 3)$ by the vector $\begin{pmatrix} 4 \\ -2 \end{pmatrix}$.</p> <p>$A' = (3, 1)$</p> 
 <p>Visual aids</p>	<p>https://www.youtube.com/watch?v=S146HcDoxm8</p>
 <p>Exercises</p>	<p><u>Activity</u></p> <ol style="list-style-type: none"> Read the notes carefully and make your own notes in your math exercise book. Each point is translated by the given vectors. Write down the coordinates of the image points. <ol style="list-style-type: none"> $(6, 5)$ is translated by $\begin{pmatrix} 1 \\ -4 \end{pmatrix}$ to $(_, _)$ $(-4, -2)$ is translated by $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$ to $(_, _)$ $(-1, 3)$ is translated by $\begin{pmatrix} 0 \\ -5 \end{pmatrix}$ to $(_, _)$ Calculate the column vectors which translate each point to the given image point. <ol style="list-style-type: none"> $A = (3, 1), A' = (5, 6)$ $B = (-1, 4), B' = (3, 0)$ $C = (-5, 1), C' = (-2, -4)$ Draw these vectors in the order given on a set of axes. <ol style="list-style-type: none"> Start at $(-2, 1)$. Then draw : $\begin{pmatrix} 2 \\ 5 \end{pmatrix}, \begin{pmatrix} 4 \\ -1 \end{pmatrix}, \begin{pmatrix} -2 \\ -5 \end{pmatrix}$,

	$\begin{pmatrix} -4 \\ 1 \end{pmatrix}$ <p>(b) Name the type of quadrilateral you have drawn.</p>
 Assignment	<p>NOTE :</p> <p>It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.</p>
 Assessment	<p>Q1. The point $P = (31, 47)$ is translated to $Q = (79, 19)$. Write down the column vector for \overrightarrow{PQ}</p> <p>Q2. Use algebra to work out the column vector used to translate $(2c, 5d)$ to $(c, 6d)$</p>
 References	<p>https://www.bbc.co.uk/bitesize/topics/zgthvcw/articles/z96k9qt</p> <p>https://www.amazon.com/Gamma-Mathematics-Homework-Book-Level/dp/0582545188</p>

LESSON PLAN

 Teacher	Name : Mrs Henry Subject : Mathematics
 Date	Week 4 : Wednesday 10/06/20
 	Topic : Vectors - Addition Of Vectors Lesson number : 3
 Learning outcomes	By the end of this lesson, students should be able to: <ul style="list-style-type: none"> • Add vectors on a plane • Add vectors on a grid • Add vectors numerically
 Introduction	<u>Addition Of Vectors</u> Vector addition is the operation of adding two or more vectors together into a <u>vector sum</u> .
 	Catch phrase for the lesson ‘ Follow the Rule’
 Learners	Summary

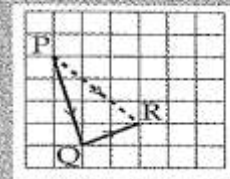
notes

- Adding vectors shows what happens when one translation is followed by another translation.
- The result of adding vectors is the short cut that takes you from the start to the end directly.

$$\underline{PQ} + \underline{QR} = \underline{PR}$$

- When adding column vectors, just add the corresponding numbers in the vectors:

$$\begin{pmatrix} 1 \\ -4 \end{pmatrix} + \begin{pmatrix} 2 \\ 1 \end{pmatrix} = \begin{pmatrix} 3 \\ 3 \end{pmatrix}$$



To add two vectors, add the corresponding components.

Let $\vec{u} = \langle u_1, u_2 \rangle$ and $\vec{v} = \langle v_1, v_2 \rangle$ be two vectors.

Then, the sum of \vec{u} and \vec{v} is the vector $\vec{u} + \vec{v} = \langle u_1 + v_1, u_2 + v_2 \rangle$



Visual aids

<https://www.youtube.com/watch?v=Emphi2zDMTo>

<https://www.youtube.com/watch?v=ZM2-Bb8Zdt0>

<https://www.youtube.com/watch?v=ci29I7a0HI8>



Exercises

Activity

1. Read the notes carefully and make your own notes in your math exercise book.
2. Calculate these vector sums :

(a) $\begin{pmatrix} 3 \\ 5 \end{pmatrix} + \begin{pmatrix} -4 \\ 1 \end{pmatrix}$

(b) $\begin{pmatrix} -6 \\ -1 \end{pmatrix} + \begin{pmatrix} 3 \\ 3 \end{pmatrix}$

3. Calculate these vector sums :

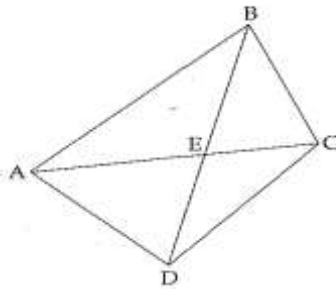
$$\underline{p} = \begin{pmatrix} 2 \\ -1 \end{pmatrix}, \quad \underline{q} = \begin{pmatrix} -3 \\ -5 \end{pmatrix}.$$

(a) $\underline{p} + \underline{q}$

(b) $2\underline{p} + \underline{q}$

(c) $4\underline{p} + 5\underline{q}$

4. Simplify these vector sums by using this diagram:



(a) $\underline{AB} + \underline{BE}$ _____

(b) $\underline{AB} + \underline{BC} + \underline{CD}$ _____

(c) $\underline{AD} + \underline{DC} + \underline{CE}$ _____

5.

$\underline{a} = \begin{pmatrix} -1 \\ 3 \end{pmatrix}$ and $\underline{b} = \begin{pmatrix} 6 \\ -1 \end{pmatrix}$. Draw a triangle of vectors to show the result of adding $\underline{a} + \underline{b}$.



Assignment

NOTE :

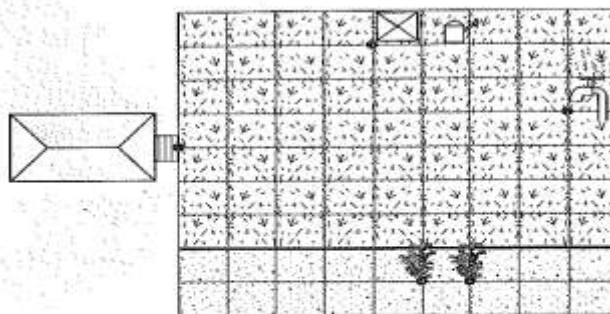
It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.



Assessment

Q1.

A gardener walks down the steps of her house and onto her lawn. She walks across the lawn to collect a watering can from a shed, takes it over and fills it from a tap, and then goes to water two tomato plants. She then returns the watering can to the shed, and walks back to the house.



The journey can be described by a series of vectors. The first of these is $\begin{pmatrix} 4 \\ 3 \end{pmatrix}$.

(a) Write down the remaining vectors for this journey.

(b) What is the sum of all the vectors (including the first)? _____










References

<https://www.amazon.com/Gamma-Mathematics-Homework-Book-Level/dp/0582545188>

<https://mathworld.wolfram.com/VectorAddition.html>

https://www.varsitytutors.com/hotmath/hotmath_help/topics/adding-and-subtracting-vectors

LESSON PLAN

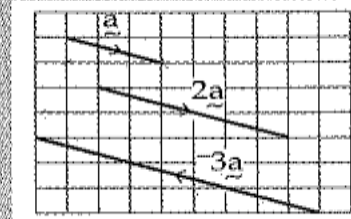
 Teacher	Name : Mrs Henry Subject :Mathematics
 Date	WEEK : 4 Thursday 11/06/20
 	Topic :_Multiplication Of Vectors by numbers Lesson number :4
 Learning outcomes	By the end of this lesson, students should be able to: <ul style="list-style-type: none"> • Multiply a vector by a scale factor
 Introduction	Multiplication of a vector by a scalar changes the magnitude of the vector, but leaves its direction unchanged. The scalar changes the size of the vector. The scalar "scales" the vector. Multiplication by a negative scalar reverses the direction of the vector.
 	Catch phrase for the lesson ‘Enhance our mathematical learning skill’
 	Summary Below is the definition for multiplying a scalar c by a vector \mathbf{a} , where $\mathbf{a} = (x, y)$. (Again, we can easily extend these principles to three dimensions.) $c \cdot \mathbf{a} = c \cdot (x, y) = (cx, cy)$

Learners notes

- To multiply a vector by a number, multiply **both** of the components in the vector. This gives a new vector with a different **length** but the same direction.
- Multiplying by a negative number gives a vector with the **opposite** direction.

$$\text{If } \underline{a} = \begin{pmatrix} 3 \\ -1 \end{pmatrix}$$

$$\text{then } 2\underline{a} = 2 \times \begin{pmatrix} 3 \\ -1 \end{pmatrix} = \begin{pmatrix} 6 \\ -2 \end{pmatrix}$$



Visual aids

<https://www.youtube.com/watch?v=MpN8BIci-Ys>



Exercises

Activity

- Read the notes carefully and make your own notes in your math exercise book.
- Answer the following questions :

1 Three vectors are $\underline{c} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$, $\underline{d} = \begin{pmatrix} 1 \\ -4 \end{pmatrix}$ and $\underline{e} = \begin{pmatrix} -8 \\ 12 \end{pmatrix}$.

Calculate these vectors:

(a) $4\underline{c}$

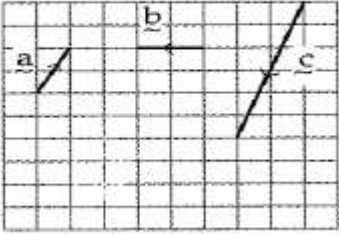



(b) $2\underline{d}$

(c) $\frac{1}{2}\underline{e}$








(d) $-3\underline{c}$

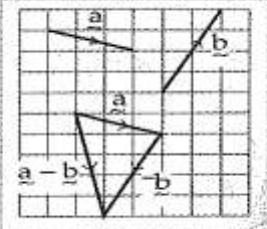


(e) $-\underline{d}$




(f) $-\frac{1}{4}\underline{e}$

	<p>2 The diagram shows the vectors \underline{a}, \underline{b} and \underline{c}.</p>  <p>Draw these vectors</p> <p>(a) $2\underline{a}$ (b) $-\underline{b}$ (c) $\frac{1}{2}\underline{c}$ ✓</p>
 Assignment	<p>NOTE :</p> <p>It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.</p>
 Assessment	<p>Q1. Complete this sentence :</p> <p>The vector $^{-}4\underline{a}$ is _____ times the length of \underline{a}, and is in the _____ direction.</p>
 References	<p>https://www.amazon.com/Gamma-Mathematics-Homework-Book-Level/dp/0582545188</p> <p>https://physics.info/vector-multiplication/</p> <p>https://www.universalclass.com/articles/math/pre-calculus/how-to-multiply-vectors-scalar-dot-product.htm</p>





LESSON PLAN

 Teacher	Name :Mrs Henry Subject :Mathematics
 Date	WEEK : 5 Monday 15/06/20
 	Topic : <u>Subtraction Of Vectors</u> Lesson number :5
 Learning outcomes	By the end of this lesson students should be able to: <ul style="list-style-type: none"> • Subtract vectors on a plane • Subtract vectors on a grid • Subtract vectors numerically
 Introduction	In order to subtract vector b from a , the direction must be reverse of vector b to get vector (-b). Then it must be added : (-b) to a.
 	Catch phrase for the lesson ‘Mistakes are just proof that you are trying’
 	Summary

<p>Learners notes</p>	<p>To subtract vectors add opposites.</p> $\begin{pmatrix} 3 \\ -1 \end{pmatrix} - \begin{pmatrix} 2 \\ 4 \end{pmatrix} = \begin{pmatrix} 3 \\ -1 \end{pmatrix} + \begin{pmatrix} -2 \\ -4 \end{pmatrix} = \begin{pmatrix} 1 \\ -5 \end{pmatrix}$ <p>Show the result of $\underline{a} - \underline{b}$ on a diagram.</p> <p>This is the same as $\underline{a} + \underline{b}$:</p>  <p>To subtract two vectors, subtract the corresponding components.</p> <p>Let $\vec{u} = \langle u_1, u_2 \rangle$ and $\vec{v} = \langle v_1, v_2 \rangle$ be two vectors.</p> <p>The difference of \vec{u} and \vec{v} is</p> $\vec{u} - \vec{v} = \vec{u} + (-\vec{v}) = \langle u_1 - v_1, u_2 - v_2 \rangle$
 <p>Visual aids</p>	<p>https://www.youtube.com/watch?v=gtXiPC6X_WU</p> <p>https://www.youtube.com/watch?v=ci29I7a0HI8</p>
 <p>Exercises</p>	<p><u>Activity</u></p> <ol style="list-style-type: none"> 1. Read the notes carefully and make your own notes in your math exercise book. 2. Answer the following questions :

	<p>1 Subtract these vectors:</p> <p>(a) $\begin{pmatrix} 6 \\ 4 \end{pmatrix} - \begin{pmatrix} 1 \\ 5 \end{pmatrix}$</p> <p>(b) $\begin{pmatrix} -2 \\ 0 \end{pmatrix} - \begin{pmatrix} 1 \\ 3 \end{pmatrix}$</p> <p>2 Given $\underline{p} = \begin{pmatrix} 2 \\ -1 \end{pmatrix}$ and $\underline{q} = \begin{pmatrix} -2 \\ 4 \end{pmatrix}$, calculate:</p> <p>(a) $\underline{p} - \underline{q}$</p> <p>(b) $2\underline{p} - 3\underline{q}$</p> <p>(c) $-3\underline{p} - 5\underline{q}$</p>
 Assignment	<p>NOTE :</p> <p>It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.</p>
 Assessment	<p>Q1. Draw a 'triangle of vectors' diagram to show the result of the vector expression $\tilde{c} - 3\tilde{d}$ when $\tilde{c} = \begin{pmatrix} -4 \\ 2 \end{pmatrix}$ and $\tilde{d} = \begin{pmatrix} 1 \\ -1 \end{pmatrix}$</p>
 References	<p>https://www.varsitytutors.com/hotmath/hotmath_help/topics/adding-and-subtracting-vectors</p> <p>https://www.amazon.com/Gamma-Mathematics-Homework-Book-Level/dp/0582545188</p> <p>https://www.toppr.com/guides/physics/motion-in-a-plane/addition-and-subtraction-of-vectors/</p>

LESSON PLAN

 Teacher	Name : Mrs Henry Subject :Mathematics
 Date	WEEK :5 Tuesday 16/06/20
 	Topic : Translation Lesson number :1
 Learning outcomes	<ul style="list-style-type: none"> • Define translation • Write the vectors of a translation
 Introduction	<p><u>TRANSFORMATION</u></p> <p>In a transformation, a point or shape is changed. There are four main transformations: translation, reflection, dilation and rotation.</p> <p>Translation is a term used in geometry to describe a function that moves an object a certain distance. The object is not altered in any other way. It is not rotated, reflected or re-sized.</p>
 	<p>Catch phrase for the lesson</p> <p>‘Translation does not change the size and direction’</p>



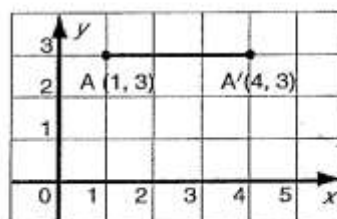
Summary

In a translation, every point or shape is moved a certain distance in a particular direction. The shape will stay the same and it will be the same size. We call the new moved shape an **image**.

There are two ways of writing a translation.

Example 1 Translate the point $(1, 3)$ 3 units in the positive x direction.

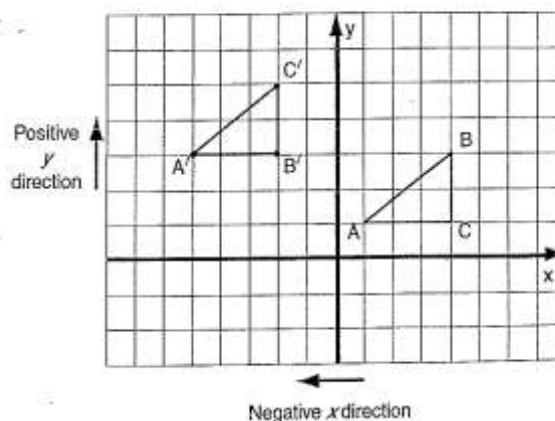
Translate just means move.



A' is the image

Positive x direction

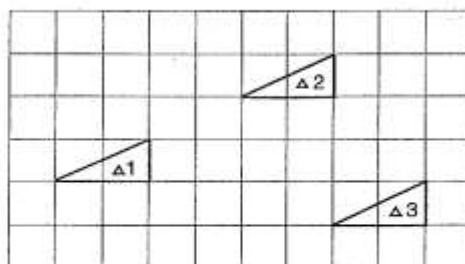
Example 2 Translate the shape ABC 6 units in the negative x direction and 2 units in the positive y direction.



Vectors are written like this

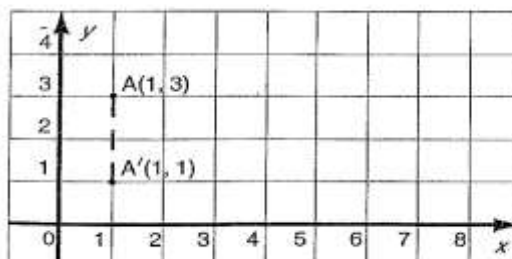
How much to move in the y direction. $\rightarrow \begin{pmatrix} x \\ y \end{pmatrix}$ \leftarrow How much to move in the x direction.

Example 3



- (a) $\Delta 1$ is mapped onto $\Delta 2$ by the translation with vector $\begin{pmatrix} 4 \\ 2 \end{pmatrix}$
- (b) $\Delta 2$ is mapped onto $\Delta 3$ by the translation with vector $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$
- (c) $\Delta 3$ is mapped onto $\Delta 2$ by the translation with vector $\begin{pmatrix} -2 \\ 3 \end{pmatrix}$

Example 4 Translate the point A (1, 3) by the vector $\begin{pmatrix} 0 \\ -2 \end{pmatrix}$



Visual aids

<https://www.youtube.com/watch?v=VJT xv-tRKj0>



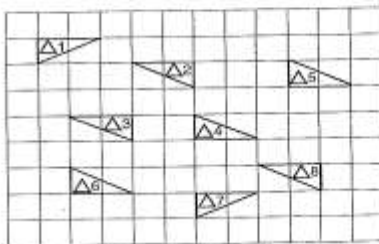
Exercises

Activity

1. Read the notes carefully and make your own notes in your math exercise book.

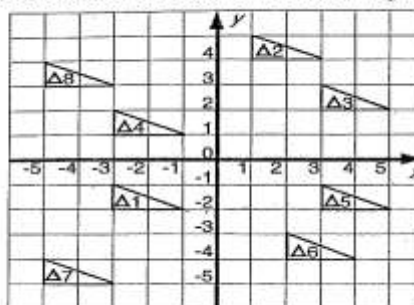
Exercise 2.1

1. Decide which of these are translations; answer 'yes' or 'no' for each part.



- | | |
|-------------------------------------|-------------------------------------|
| (a) $\Delta 1 \rightarrow \Delta 2$ | (k) $\Delta 2 \rightarrow \Delta 6$ |
| (b) $\Delta 1 \rightarrow \Delta 3$ | (l) $\Delta 2 \rightarrow \Delta 7$ |
| (c) $\Delta 1 \rightarrow \Delta 4$ | (m) $\Delta 2 \rightarrow \Delta 8$ |
| (d) $\Delta 1 \rightarrow \Delta 5$ | (n) $\Delta 3 \rightarrow \Delta 6$ |
| (e) $\Delta 1 \rightarrow \Delta 6$ | (o) $\Delta 3 \rightarrow \Delta 8$ |

3. Write down the vector for each of the following translations:



- | | |
|-------------------------------------|-------------------------------------|
| (a) $\Delta 1 \rightarrow \Delta 2$ | (k) $\Delta 2 \rightarrow \Delta 6$ |
| (b) $\Delta 1 \rightarrow \Delta 3$ | (l) $\Delta 2 \rightarrow \Delta 8$ |
| (c) $\Delta 1 \rightarrow \Delta 4$ | (m) $\Delta 3 \rightarrow \Delta 5$ |
| (d) $\Delta 1 \rightarrow \Delta 5$ | (n) $\Delta 8 \rightarrow \Delta 2$ |
| (e) $\Delta 1 \rightarrow \Delta 6$ | (o) $\Delta 4 \rightarrow \Delta 2$ |
| (f) $\Delta 1 \rightarrow \Delta 7$ | (p) $\Delta 7 \rightarrow \Delta 5$ |
| (g) $\Delta 1 \rightarrow \Delta 8$ | (q) $\Delta 6 \rightarrow \Delta 3$ |



Assignment

NOTE :

It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.




Assessment

This picture shows a real life example of translation.










Movement of aircraft across the sky.

Write down a real life example of translation that you can think of.

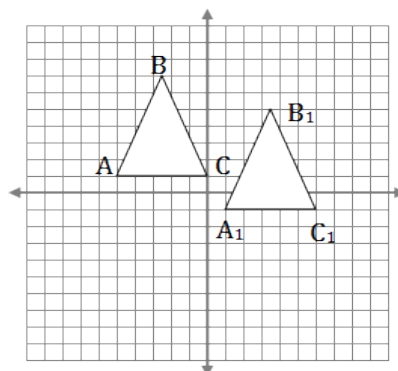
 <p>References</p>	<p>https://study.com/academy/lesson/what-is-translation-in-math-definition-examples-terms.html</p>

LESSON PLAN

 Teacher	Name : Mrs Henry Subject : Mathematics
 Date	WEEK : 5 Wednesday 17/06/20
 	Topic : Translation on a grid Lesson number : 2
 Learning outcomes	By the end of this lesson students should be able to: <ul style="list-style-type: none"> • Translate a shape on a grid • Translate a shape on a set of axes
 Introduction	<u>Translation on a grid</u> We can translate a shape on a pair of axis by moving it up or down or from side to side, but its appearance does not change. When we translate a shape, each of the vertices must be moved in exactly the same way. Every translation has a translation vector which gives the direction in which the shape is moved.
 	Catch phrase for the lesson ‘Translation is made from a translation vector’
 	Summary To be able to translate a shape on a grid: <ol style="list-style-type: none"> 1. Plot the points on a pair of axis and connect the points to make a polygon. 2. Label your shape and carry out the transformation. Translate

Learners notes

the shape by the given vector and label the image.
3. State fully the single transformation that maps the shape to its image.



For example ;
The points of $\triangle ABC$ are plotted on a pair of axis and are labelled.
 $\triangle ABC$ is translated to $\triangle A_1B_1C_1$ by vector $\begin{pmatrix} 6 \\ -2 \end{pmatrix}$



Visual aids

<https://www.youtube.com/watch?v=2cqM5gAASoM>

https://www.youtube.com/watch?v=XdjH_EWhCZ0

<https://www.youtube.com/watch?v=qb4ElyditqY>



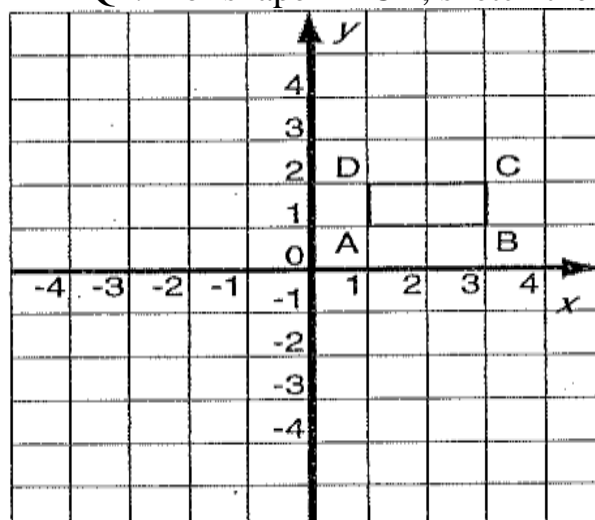
Exercises

Activity



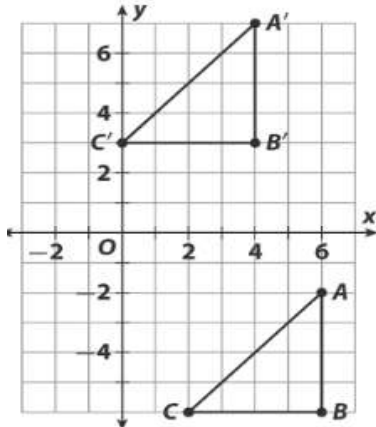

1. Read the notes carefully and make your own notes in your math exercise book.

2. Exercise 2.1(P.35)





Q4. For shape ABCD, sketch the image after a

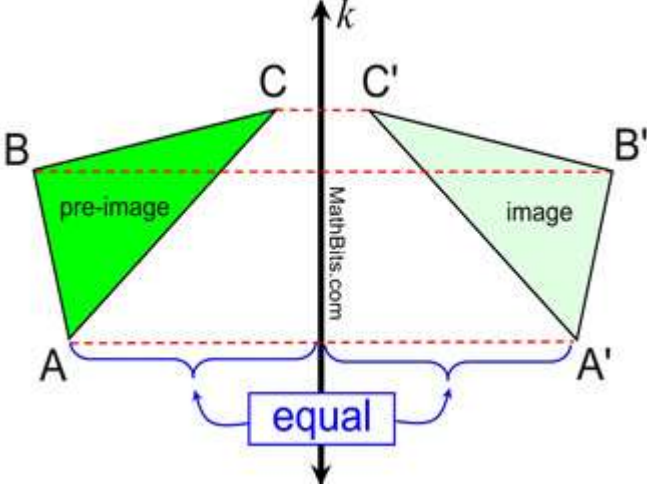




- translation 2 units in the positive y direction.
- translation 3 units in the negative x direction
- translation 2 units in the positive x direction and 4 units in the negative y direction.

	<p>5. (a) Draw a set of axes with $-7 \leq x \leq 7$ and $-7 \leq y \leq 7$.</p> <p>(b) Draw $\triangle 1$ by joining $(-4, 3)$, $(-4, -5)$ and $(-3, -3)$.</p> <p>(c) Draw and label $\triangle 2$, $\triangle 3$, $\triangle 4$, $\triangle 5$, $\triangle 6$, $\triangle 7$ and $\triangle 8$ as follows:</p> <p>(i) $\triangle 1 \longrightarrow \triangle 2$ by translation $\begin{pmatrix} 5 \\ 6 \end{pmatrix}$</p> <p>(ii) $\triangle 1 \longrightarrow \triangle 3$ by translation $\begin{pmatrix} 6 \\ 1 \end{pmatrix}$</p> <p>(iii) $\triangle 1 \longrightarrow \triangle 4$ by translation $\begin{pmatrix} 1 \\ 8 \end{pmatrix}$</p> <p>(iv) $\triangle 1 \longrightarrow \triangle 5$ by translation $\begin{pmatrix} 9 \\ -2 \end{pmatrix}$</p> <p>(v) $\triangle 1 \longrightarrow \triangle 6$ by translation $\begin{pmatrix} -2 \\ 6 \end{pmatrix}$</p> <p>(vi) $\triangle 1 \longrightarrow \triangle 7$ by translation $\begin{pmatrix} 1 \\ -2 \end{pmatrix}$</p> <p>(vii) $\triangle 1 \longrightarrow \triangle 8$ by translation $\begin{pmatrix} 9 \\ 9 \end{pmatrix}$</p> <p>(d) Write down the co-ordinates of the vertices or points of the triangle 2, 3, 4, 5, 6, 7, and 8.</p>
 Assignment	<p>NOTE :</p> <p>It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.</p>
 Assessment	<p>Q1. Determine how to translate $\triangle A'B'C'$ to $\triangle ABC$.</p> 
 References	<p>https://www.onlinemathlearning.com/transformation.html</p> <p>https://www.helpingwithmath.com/by_subject/geometry/geo_transformations_8g3.htm</p>

LESSON PLAN

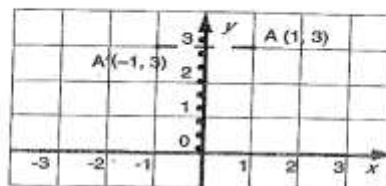
 Teacher	Name : Mrs Henry Subject : Mathematics
 Date	WEEK : 5 Thursday 18/06/20
	Topic : Reflection Lesson number : 1
 Learning outcomes	By the end of this lesson students should be able to: <ul style="list-style-type: none">• Define Reflection• Reflect shape on a plane
 Introduction	<u>Reflection</u> Reflection is a transformation where each point in a shape appears at an equal distance on the opposite side of a given line - the line of reflection . Every point on the original triangle is " reflected " in the line of reflection and appears on the right side an equal distance from the line.

	
	<p>Catch phrase for the lesson ‘Life is a reflection of what we allow ourselves to see’</p>
 Learners notes	<p>Summary In a reflection, every point on a shape is reflected in a given straight line. The most common lines to reflect in are the x axis, the y axis and the line $y = x$.</p>

Example 1 Reflect the point A (1, 3) in the y axis.



A' is the image

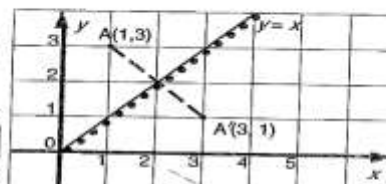


Example 2 Reflect the point A (1, 3) in the line $y = x$.

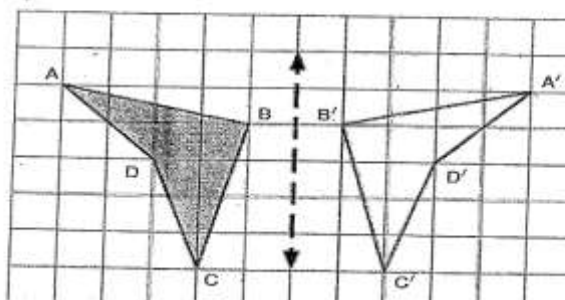
Note that
A(1, 3) \rightarrow A'(3, 1)



The x and y values have "swapped"

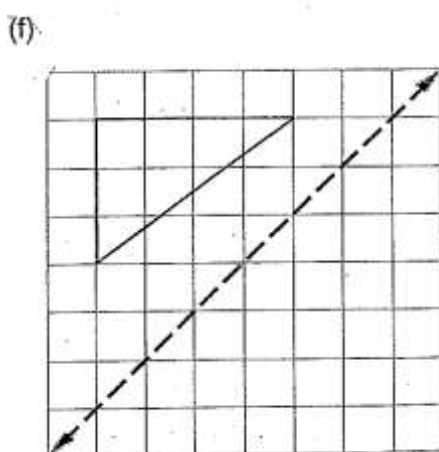
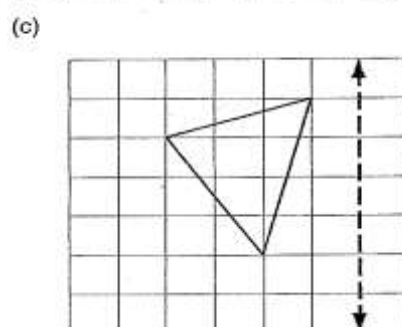
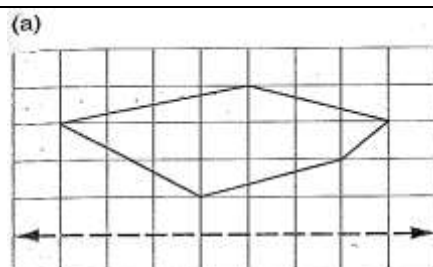


Example 3 Reflect the shape ABCD in the broken line.



Visual aids

<https://www.youtube.com/watch?v=VJT xv-tRKj0>



Activity

1. Read the notes carefully and make your own notes in your math exercise book.

2. Exercise 2.2 (P.39-40)
On square paper, draw each of the following shape and its image after reflection in the broken line :



Assignment

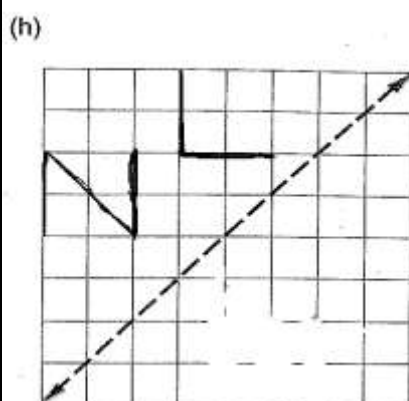
NOTE :

It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.



Assessment

Q 1. Draw the letters and their image after reflection in the reflection line.












References

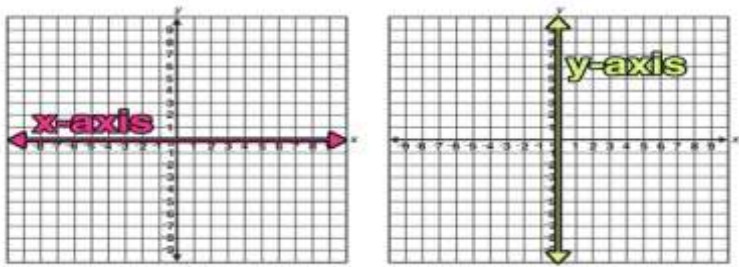


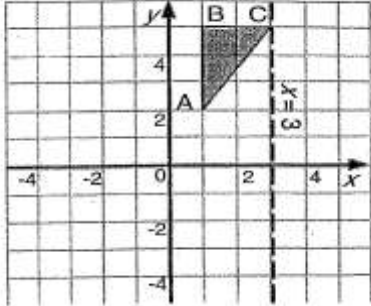
<https://www.mathopenref.com/reflect.html>





<http://www.amathsdictionaryforkids.com/gr/r/reflection.html>

<https://mathbitsnotebook.com/Geometry/Transformations/TRTransformationReflection.html>






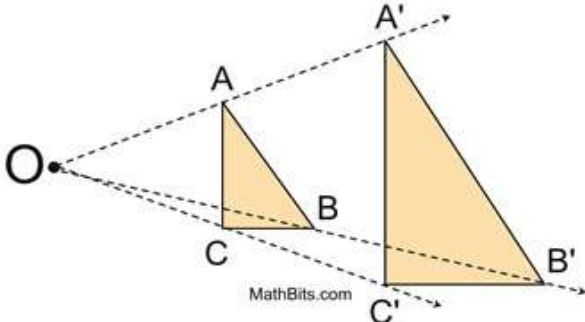
LESSON PLAN

 Teacher	Name : Mrs Henry Subject : Mathematics
 Date	WEEK : 6 Monday 22/06/20
 	Topic : Reflection on a set of axes Lesson number : 2
 Learning outcomes	By the end of this lesson students should be able to: <ul style="list-style-type: none"> • Reflect the shape on a set of axes
 Introduction	<u>Reflection on a set of axes</u> Learning how to perform a reflection of a point, a line, or a figure across the x axis or across the y axis is an important skill that every geometry math student must learn.
 	Catch phrase for the lesson ‘The eye is the mirror of the soul’
 	Summary A reflection of a point, a line, or a figure in the X axis involved reflecting the image over the x axis to create a mirror image. In this case, the x axis would be called the axis of reflection .

<p>Learners notes</p>	
 Visual aids	<p>https://www.youtube.com/watch?v=8-UKE-MaQeo</p> <p>https://www.youtube.com/watch?v=ouNp8FtgiEE</p>
 Exercises	<p><u>Activity</u></p> <ol style="list-style-type: none"> Read the notes carefully and make your own notes in your math exercise book Exercise 2.2 (P.41 – 42) <p>3. Draw the image of $\triangle ABC$ after reflection in the lines indicated.</p> <ol style="list-style-type: none"> the x axis. Label it $\triangle 1$. the y axis. Label it $\triangle 2$. the line $x = 3$. Label it $\triangle 3$.  <p>5. (a) Plot and label $L(7, -5)$, $M(7, -2)$ and $N(5, -2)$</p> <p>(b) Draw the image of LMN after reflection in:</p> <ol style="list-style-type: none"> the x axis. Label it $\triangle 1$. the line $y = x$. Label it $\triangle 2$. the line $y = -x$. Label it $\triangle 3$.

 Assignment	<p>NOTE : It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.</p>
 Assessment	<p>Q1. Identify this image as translation, rotation or reflection.</p>  <p>8. (a) Draw and label the following triangles: $\triangle 1$: (3, 7), (7, 7), (7, 5) $\triangle 2$: (7, -5), (7, -7), (3, -7) $\triangle 3$: (7, 3), (7, 1), (3, 1) $\triangle 4$: (-3, 7), (-1, 7), (-1, 5) $\triangle 5$: (3, 7), (-1, 7), (-1, 5)</p> <p>(b) Find the equation of the mirror-line for the reflection: (i) $\triangle 1$ onto $\triangle 2$ (iii) $\triangle 1$ onto $\triangle 4$ (ii) $\triangle 1$ onto $\triangle 3$ (iv) $\triangle 1$ onto $\triangle 5$.</p>
 References	<p>https://mashupmath.com/blog/reflection-over-x-y-axis</p>

LESSON PLAN

 Teacher	Name : Mrs Henry Subject : Mathematics
 Date	WEEK : 6 Tuesday 23/06/20
 	Topic : Dilation (Enlargement) Lesson number : 5
 Learning outcomes	By the end of this lesson students should be able to: <ul style="list-style-type: none"> • Define Reflection • Enlarge the shape by a scale factor and centre of enlargement
 Introduction	<p><u>Dilation</u></p> <p>A dilation is a transformation that produces an image that is the same shape as the original, but is a different size.</p> 



Catch phrase for the lesson
'Enlargement teaches us to be careful'



Summary

Dilation

By dilating a shape or point, we make it bigger or smaller.

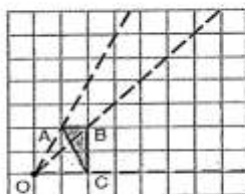
If a shape is changed so that it is twice as big, we say that it has been dilated or enlarged by a **scale factor** of 2.

To draw any dilated shape, we need two things:

1. The scale factor
2. The centre (or point) of enlargement.

Learners
notes

Example 1 Enlarge triangle ABC by a scale factor of 3 and centre O as shown:



Step 1

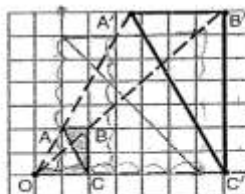
Draw lines from O through each vertex, A, B and C.

Step 2

Mark the points A', B' and C'. These will be 3 times the distance from O as A, B and C.

These will be 3 times the distance from O as A, B and C.

e.g. C is 2 squares from O
So C' will be 6 squares from O.



Step 3


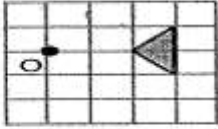
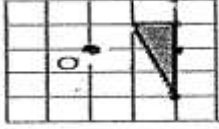
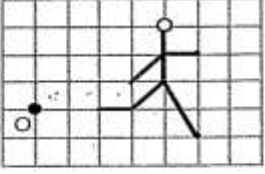
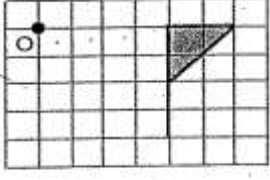


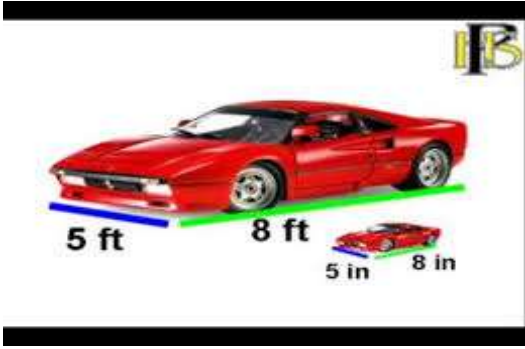

Join A', B' and C'.

$\triangle A'B'C'$ is three times as big as $\triangle ABC$.









Visual aids

<https://www.youtube.com/watch?v=Zc4tG5wIC4Y>

 <p>Exercises</p>	<p><u>Activity</u></p> <ol style="list-style-type: none"> 1. Read the notes carefully and make your own notes in your math exercise book 2. Do Exercise 2.3 (P.45) <p>Q1. Copy each diagram onto squared paper and draw the enlargement for the given scale factor and centre of enlargement.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>(a)</p>  <p>scale factor 2</p> </div> <div style="text-align: center;"> <p>(b)</p>  <p>scale factor 3</p> </div> </div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>(g)</p>  <p>scale factor 3</p> </div> <div style="text-align: center;"> <p>(h)</p>  <p>scale factor 1</p> </div> </div>
 <p>Assignment</p>	<p>NOTE :</p> <p>It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.</p>
 <p>Assessment</p>	<p>Q1. Find the scale factor that was used to make the toy car.</p> <div style="text-align: center;">  </div>
 <p>References</p>	<p>https://mathbitsnotebook.com/Geometry/Transformations/TRTransformationDilations.html</p> <p>https://www.youtube.com/watch?v=u2EgwMYwibw</p>

LESSON PLAN

 <p>Teacher</p>	<p>Name : Mrs Henry Subject : Mathematics</p>
 <p>Date</p>	<p>WEEK : 6 Wednesday 24/06/20</p>
	<p>Topic : Dilation on a set of axis Lesson number : 6</p>
 <p>Learning outcomes</p>	<p>By the end of this lesson students should be able to:</p> <ul style="list-style-type: none"> • Enlarge a shape by a scale factor and centre of enlargement on a set of axis.
 <p>Introduction</p>	<p><u>Dilation on a pair of axis</u> Objects in the coordinate plane can be dilated. Usually, the center of dilation in a coordinate plane is the origin, (0,0). Sometimes the centre of dilation can be another point.</p>
	<p>Catch phrase for the lesson “Moving clocks run slowly.”</p>



Learners notes

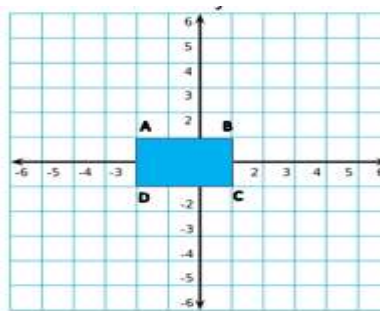
Summary

To find the dilated image, we first must know the coordinates of our original image. Then we simply multiply the coordinate by the scale factor to find the dilated image.

Example 1

Graph the rectangle ABCD with coordinates A(-2, 1), B(1, 1), C(1, -1), D(-2, -1). Then dilate the image by a scale factor of 2 with the origin as the center of dilation.

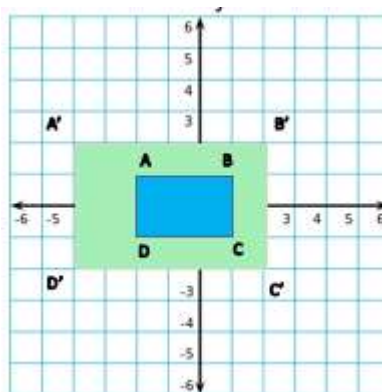
First, we start by plotting the points for the rectangle ABCD.



Next, we take all of the coordinates, and we multiply them by 2.

$A'(-4, 2)$, $B'(2, 2)$, $C'(2, -2)$, $D'(-4, -2)$

Now we graph the new image with the original image.



Visual aids

<https://www.youtube.com/watch?v=Zc4tG5wIC4Y>



Activity

1. Read the notes carefully and make your own notes in your math exercise book
2. Exercise 2.3 (P.46 – 47). Do questions 3 & 5.

3. (a) Plot and label the triangles
 $\triangle 1: (-5, 7), (-5, 4), (-6, 4)$
 $\triangle 2: (-6, -2), (-6, -4), (-5, -4)$
 $\triangle 3: (2, 6), (5, 6), (5, 5)$
- (b) Draw the image of $\triangle 1$ after enlargement with scale factor 3, centre $(-7, 7)$. Label the image $\triangle 4$.
- (c) Draw the image of $\triangle 2$ after enlargement with scale factor 2, centre $(-7, -2)$. Label the image $\triangle 5$.
- (d) Draw the image of $\triangle 3$ after enlargement with scale factor 2, centre $(4, 7)$. Label the image $\triangle 6$.

5. (a) Plot and label the triangles
 $\triangle 1: (4, 3), (7, 3), (7, 2)$
 $\triangle 2: (2, -2), (2, -5), (3, -5)$
 $\triangle 3: (-4, -2), (-7, -2), (-7, -3)$
- (b) Draw the image of $\triangle 1$ after enlargement with scale factor 3, centre $(7, 4)$. Label the image $\triangle 4$.
- (c) Draw the image of $\triangle 2$ after enlargement with scale factor 2, centre $(4, -3)$. Label the image $\triangle 5$.
- (d) Draw the image of $\triangle 3$ after enlargement with scale factor 3, centre $(-7, -5)$. Label the image $\triangle 6$.



Assignment

NOTE :

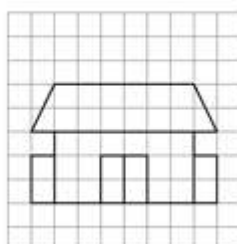
It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.




Assessment







Q1.

Enlarge the image using the scale factor of 2.



 <p>References</p>	<p>https://mathbitsnotebook.com/Geometry/Similarity/SMdilation.html</p> <p>https://study.com/academy/lesson/dilation-in-a-coordinate-plane.html</p> <p>https://www.ck12.org/book/ck-12-algebra-i-honors/section/10.4/</p> <p>Maths 9 Book 3</p>

LESSON PLAN

 Teacher	Name : Mrs Henry Subject : Mathematics
 Date	WEEK : 6 Thursday 25/06/20
	Topic : Dilation of reduced shape Lesson number : 7
 Learning outcomes	By the end of this lesson students should be able to: <ul style="list-style-type: none"> • Reduce a shape by a scale factor and centre of enlargement.
 Introduction	<p><u>Dilation of reduced shape</u></p> <p>A dilation is also a reduction of an object by a scale factor and with center of dilation.</p> <p>An object is reduced if the scale factor is a fraction, less than 1.</p>
	<p>Catch phrase for the lesson</p> <p>‘Dilation helps us get deeper’</p>



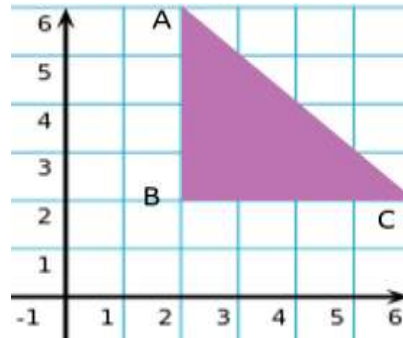
Learners
notes

Summary

Example 1:

Graph the triangle ABC with coordinates A(2, 6), B(2, 2), C(6, 2). Then dilate the image by a scale factor of $\frac{1}{2}$ with the origin as the center of dilation.

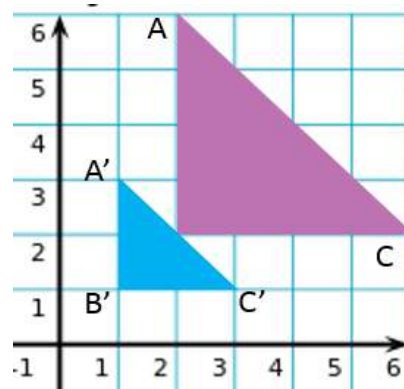
First, we graph our original triangle in the coordinate plane.



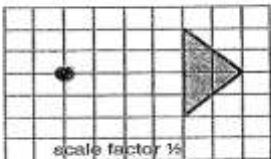
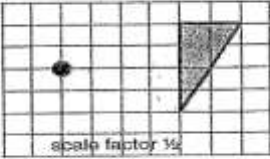
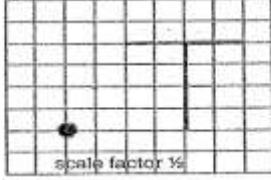
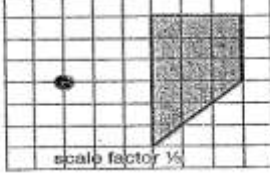



Next, we multiply each coordinate by the scale factor of $\frac{1}{2}$. Multiplying by $\frac{1}{2}$ is the same as dividing each coordinate by 2.

A'(1, 3), B'(1, 1), C'(3, 1)

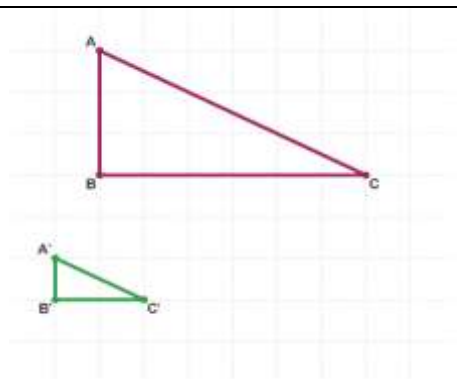
Then, we graph the new image with the original image.



 Visual aids	https://www.youtube.com/watch?v=HrR352OgdCY
 Exercises	<p><u>Activity</u></p> <ol style="list-style-type: none"> Read the notes carefully and make your own notes in your math exercise book Exercise 2.3 (P. 47 – 48) Do questions 6 & 7 <p>6. Copy each diagram onto squared paper and draw the reduced shape for the given scale factor and centre O.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>(a)</p>  </div> <div style="text-align: center;"> <p>(b)</p>  </div> </div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>(c)</p>  </div> <div style="text-align: center;"> <p>(d)</p>  </div> </div> <p>7. (a) Plot and label the triangles $\triangle 1$: (7, 6), (1, 6), (1, 3) $\triangle 2$: (7, -1), (7, -7), (3, -7) $\triangle 3$: (-5, 7), (-5, 1), (-7, 1).</p> <p>(b) Draw $\triangle 4$, the image of $\triangle 1$ after an enlargement with scale factor $\frac{1}{3}$, centre (-2, 0).</p> <p>(c) Draw $\triangle 5$, the image of $\triangle 2$ after an enlargement with scale factor $\frac{1}{2}$, centre (-5, -7).</p> <p>(d) Draw $\triangle 6$, the image of $\triangle 3$ after an enlargement with scale factor $\frac{1}{2}$, centre (-7, -5).</p>
 Assignment	<p>NOTE :</p> <p>It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.</p>



Assessment



Q1. Copy the diagram as shown. Find the centre of enlargement and scale factor for enlarging ΔABC to $\Delta A'B'C'$








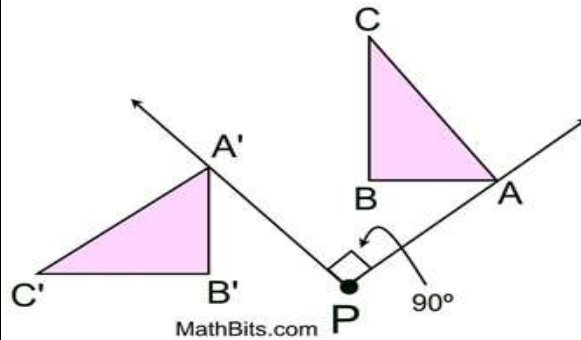
References

<https://study.com/academy/lesson/dilation-in-a-coordinate-plane.html>

[Maths 9 Book 3](#)

LESSON PLAN

 Teacher	Name : Mrs Henry Subject : Mathematics
 Date	WEEK : 7 Monday 29/06/20
 	Topic : Rotation in a plane Lesson number : 8
 Learning outcomes	By the end of this lesson students should be able to: <ul style="list-style-type: none"> • Rotate a shape in a plane of 90°, 180°, 270° and 360° centered about the centre of rotation
 Introduction	<u>Rotation in a plane</u> A rotation is a transformation that turns a figure about a fixed point called the <i>center of rotation</i> .



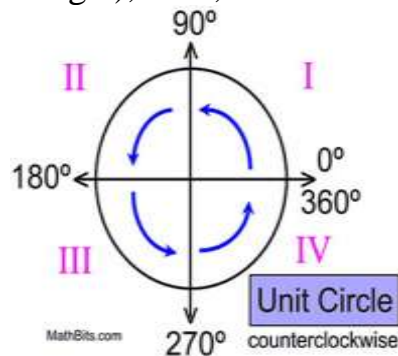
Catch phrase for the lesson
“ The great rotation”



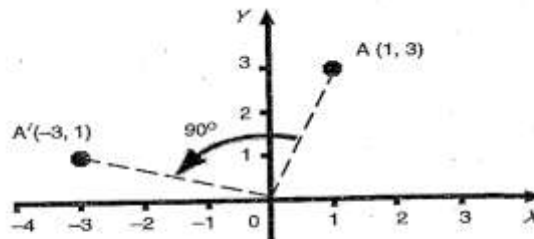
Summary

- An object and its rotation are the **same shape and size**, but the figures may be turned in different directions.
- Rotations may be **clockwise** or **counterclockwise**.

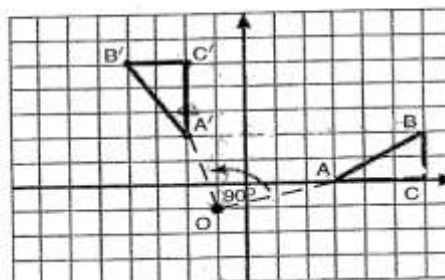
When working with rotations, you should be able to recognize angles of 90° (a right angle), 180° , 270° and 360° .



Example 1 Rotate the point A (1, 3) 90° about the point (0, 0).



Example 2 Rotate $\triangle ABC$ 90° anticlockwise about O.



Learners
notes



Visual aids

<https://www.youtube.com/watch?v=VJT xv-tRKj0>

<https://www.youtube.com/watch?v=1sxml4Y1K3s>

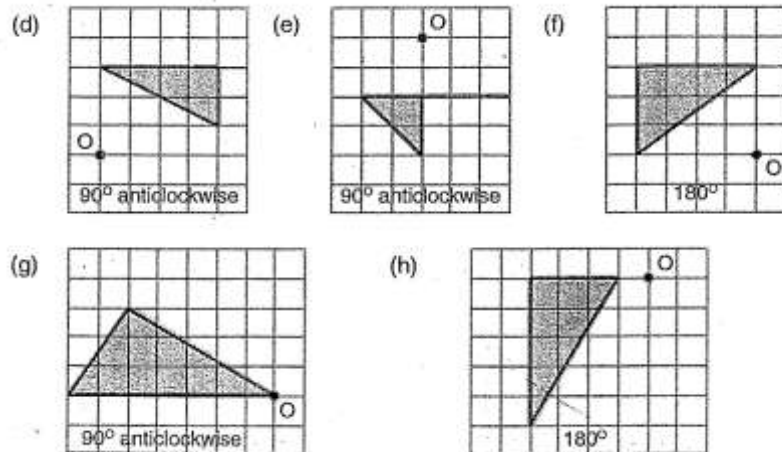
<https://flexbooks.ck12.org/cbook/ck-12-interactive-middle-school-math-8-for-ccss/section/1.10/primary/lesson/rotations-on-the-coordinate-plane-msm8-ccss>



Exercises

Activity

1. Read the notes carefully and make your own notes in your math exercise book
 2. Do Exercise 2.4 (P.50) – Q1
- Q1. Draw the shape on squared paper and find the image after the following rotations :



Assignment

NOTE :

It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.

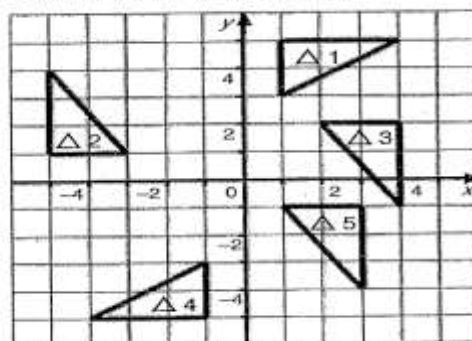



Assessment

Q1. Find the coordinates of the centre of the following rotations :





Find the coordinates of the centre of the following rotations:




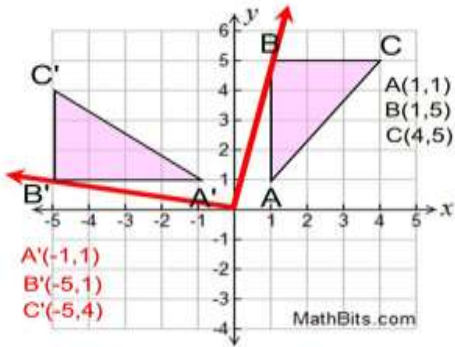


- (a) $\triangle 1 \rightarrow \triangle 2$
- (b) $\triangle 1 \rightarrow \triangle 3$
- (c) $\triangle 1 \rightarrow \triangle 4$
- (d) $\triangle 1 \rightarrow \triangle 5$



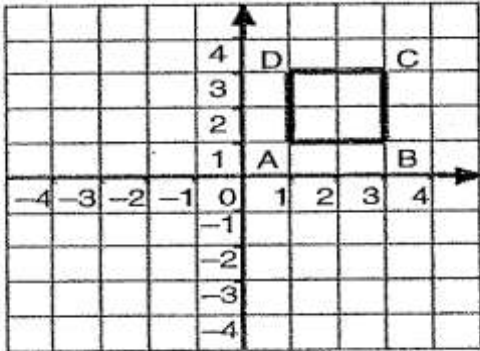


 References	https://mathbitsnotebook.com/Geometry/Transformations/TRTransformationRotations.html Maths 9 Book 3
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LESSON PLAN

 Teacher	Name : Mrs Henry Subject : Mathematics
 Date	WEEK : 7 Tuesday 30/06/20
 	Topic : Rotation on a grid Lesson number : 9
 Learning outcomes	By the end of this lesson students should be able to: <ul style="list-style-type: none"> • Rotate a shape on a grid of 90°, 180°, 270° and 360° centered about the centre of rotation

 Introduction	<p><u>Rotation on a grid</u></p> <p>Rotations on a coordinate grid are considered to be counterclockwise, unless otherwise stated. While most rotations will be centered at the origin, the center of rotation will be indicated in the problem.</p>
 	<p>Catch phrase for the lesson</p> <p>“Shapes create a giraffe and a camel when rotated”</p>
 Learners notes	<p>Summary</p> <p>To rotate a shape on a grid :</p> <ol style="list-style-type: none"> 1. Plot the points on a pair of axis and join the points 2. Label the points of the shape 3. Rotate the shape as indicated in the problem 4. Label the image of the rotated shape. <p>Example : Rotate $\triangle ABC$ 90° clockwise about the origin.</p>  <p>STEP1 : Plot the points on a coordinate plane</p> <p>STEP 2 : Join the points and label the shape</p> <p>STEP 3 : Rotate the shape using the centre of rotation and the given angle</p>
 Visual aids	<p>https://www.youtube.com/watch?v=NhtTKhP3d6s</p>
 Exercises	<p><u>Activity</u></p> <ol style="list-style-type: none"> 1. Read the notes carefully and make your own notes in your math exercise book

	<p>2. Do Exercise 2.4 (P.50) – Q's 2 & 3</p> <p>2. (a) Plot and label A(3, 3), B(7, 3), C(7, 1) and D(-1, -3), E(-1, -7), F(-3, -7).</p> <p>(b) Rotate $\triangle ABC$ 90° anticlockwise about (0, 0) onto $\triangle A'B'C'$.</p> <p>(c) Rotate $\triangle ABC$ 90° clockwise about (0, 0) onto $\triangle A''B''C''$.</p> <p>(d) Rotate $\triangle DEF$ 180° about (0, 0) onto $\triangle D'E'F'$.</p> <p>3. (a) Plot and label K(-6, -6), L(-2, -6), M(-2, -3).</p> <p>(b) Draw the image of $\triangle KLM$ after the following rotations:</p> <p>(i) 90° clockwise about (0, 0): label it K' L' M'.</p> <p>(ii) 90° anticlockwise about (-1, -1): label it K' L' M'.</p> <p>(iii) 180° about (0, -2): label it K* L* M*.</p> <p>(iv) 90° clockwise about (5, -4): label it K^o L^o M^o.</p>
 Assignment	<p>NOTE :</p> <p>It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.</p>
 Assessment	<p>Q1. Draw the image after the following rotations</p> <p>(a) </p> <p>(v) 90° about the point (0, 0)</p> <p>(vi) -90° about (0, 0)</p> <p>(vii) 180° about (0, 0)</p> <p>(viii) 270° about (0, 0)</p> <p>(ix) 360° about (0, 0)</p>
	<p>http://mathbitsnotebook.com/JuniorMath/Transformations/TFrotations.html</p> <p>Maths 9 Book 3</p>



References

LESSON PLAN



Teacher

Name : Mrs Henry
Subject : Mathematics



Date

WEEK : 7
Wednesday
01/07/20



Topic : Effects of two transformation
Lesson number : 10



Learning
outcomes

By the end of this lesson students should be able to:

- Find the effect of two or more transformation



Introduction

Combination of Transformations

One transformation can be followed by one or more further transformations.



Catch phrase for the lesson

‘ Change yourself to be stronger’

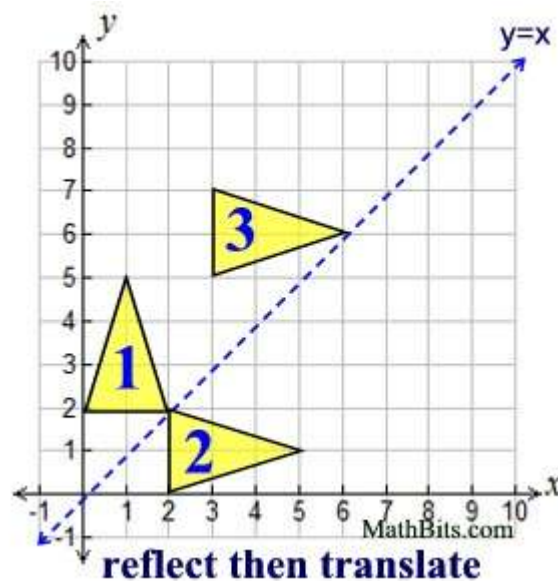


Learners
notes





Summary


When two or more transformations are combined to form a new transformation, the result is called a **composition of transformations**, or a **sequence of transformations**. In a composition, one transformation produces an image upon which the other transformation is then performed.

For Example :








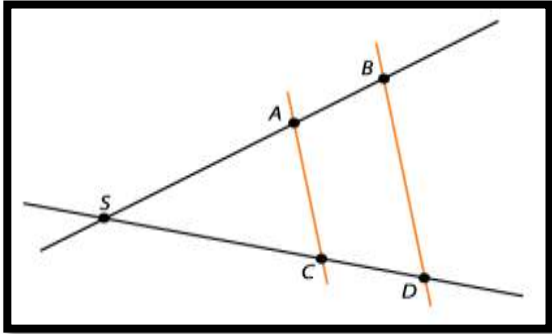


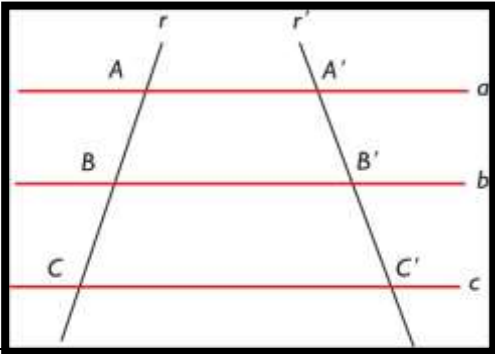
$\Delta 1$ is reflected on the line $y = x$ into $\Delta 2$. Then $\Delta 2$ is translated onto $\Delta 3$ by $\begin{pmatrix} 1 \\ 5 \end{pmatrix}$.

 Visual aids	https://www.youtube.com/watch?v=zhATKh7ikG4 https://www.youtube.com/watch?v=QfyTdwUIH-s						
 Exercises	<p><u>Activity</u></p> <ol style="list-style-type: none"> 1. Read the notes carefully and make your own notes in your math exercise book 2. Draw axes with x and y from -8 to +8. Then plot and label the following triangles : $\Delta 1 : (-6,6), (-2,6), (-2,4)$ $\Delta 2 : (2,4), (4,4), (4,8)$ $\Delta 3 : (4,3), (8,3), (8,1)$ $\Delta 4 : (4,-2), (6,-2), (6,-6)$ $\Delta 5 : (-2,-4), (-2,-6), (-6,-6)$ <p>Describe fully the following transformations</p> <table border="0"> <tr> <td>(a) $\Delta 1 \rightarrow \Delta 2$</td> <td>(b) $\Delta 1 \rightarrow \Delta 3$</td> </tr> <tr> <td>(c) $\Delta 1 \rightarrow \Delta 4$</td> <td>(d) $\Delta 1 \rightarrow \Delta 5$</td> </tr> <tr> <td>(e) $\Delta 2 \rightarrow \Delta 3$</td> <td>(f) $\Delta 4 \rightarrow \Delta 5$</td> </tr> </table>	(a) $\Delta 1 \rightarrow \Delta 2$	(b) $\Delta 1 \rightarrow \Delta 3$	(c) $\Delta 1 \rightarrow \Delta 4$	(d) $\Delta 1 \rightarrow \Delta 5$	(e) $\Delta 2 \rightarrow \Delta 3$	(f) $\Delta 4 \rightarrow \Delta 5$
(a) $\Delta 1 \rightarrow \Delta 2$	(b) $\Delta 1 \rightarrow \Delta 3$						
(c) $\Delta 1 \rightarrow \Delta 4$	(d) $\Delta 1 \rightarrow \Delta 5$						
(e) $\Delta 2 \rightarrow \Delta 3$	(f) $\Delta 4 \rightarrow \Delta 5$						
 Assignment	<p>NOTE :</p> <p>It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.</p>						
 Assessment	<p>Q 1. Draw a pair of axes with values of x and y from -8 to +8.</p> <p>(a). Plot and label $\Delta 1 : (1,6), (1,8), (5,8)$ $\Delta 4 : (-2,-8), (-7,-8), (-7,-5).$</p> <p>(b). Draw the triangles $\Delta 2, \Delta 3, \Delta 5$ and $\Delta 6$ as follows :</p> <ol style="list-style-type: none"> (i) $\Delta 1 \rightarrow \Delta 2$: reflection in the line $y = x$ (ii) $\Delta 2 \rightarrow \Delta 3$: reflection in the x- axis. (iii) $\Delta 4 \rightarrow \Delta 5$: rotation 90° clockwise, centre $(0,0)$. (iv) $\Delta 5 \rightarrow \Delta 6$: translation $\begin{pmatrix} 5 \\ -2 \end{pmatrix}$. <p>(c). Write down the coordinates of the ‘pointed ends’ of triangles $\Delta 2, \Delta 3, \Delta 5, \Delta 6$.</p>						

 <p>References</p>	<p>https://mathbitsnotebook.com/Geometry/Transformations/TRCompositeTransformations.html</p> <p>https://wtmaths.com/combination_transformations.html</p> <p>Complete Mathematics for GCSE and Standard Grade</p>

LESSON PLAN

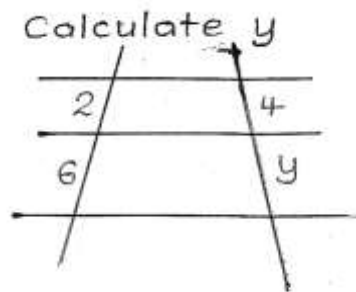
 <p>Teacher</p>	<p>Name : Mrs Henry</p> <p>Subject : Mathematics</p>
 <p>Date</p>	<p>WEEK : 7</p> <p>Thursday</p> <p>02/07/20</p>
	<p>Topic : Intercept Theorem</p> <p>Lesson number : 1</p>

 <p>Learning outcomes</p>	<p>By the end of this lesson students should be able to:</p> <ul style="list-style-type: none"> • Know and use the intercept theorem along transversals
 <p>Introduction</p>	<p><u>Intercept Theorem 1</u></p> <p>The Intercept theorem provides the ratios between the line segments created when parallel lines are intercepted by intersecting lines.</p>  <p>It is sometimes called “Thales’ Theorem”</p>
	<p><u>Catch phrase for the lesson</u></p> <p>‘Look for corresponding sides’</p>
 <p>Learners notes</p>	<p><u>Summary</u></p> <p>If we have three parallel straight lines, a, b and c, and they intersect the transversal lines, r and r’.</p> <p>The corresponding sides are : AB : BC, and A’B’ : B’C’</p> <p>The proportional segments they produce are :</p>  $\frac{AB}{BC} = \frac{A'B'}{B'C'}$

To be able to find the Unknown proportional segments :

1. Locate corresponding sides
2. Set up ratios
3. Cross multiply the ratios.
4. Solve the unknown.

Example :



$$\begin{aligned} 2 : 6 &, 4 : y \\ \frac{2}{6} &= \frac{4}{y} \\ 2(y) &= 4(6) \\ 2y &= 24 \\ y &= \frac{24}{2} \\ y &= 12 \end{aligned}$$



Visual aids

<https://www.youtube.com/watch?v=L9oYbpKLypE>


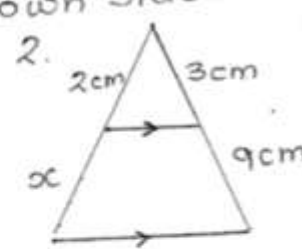
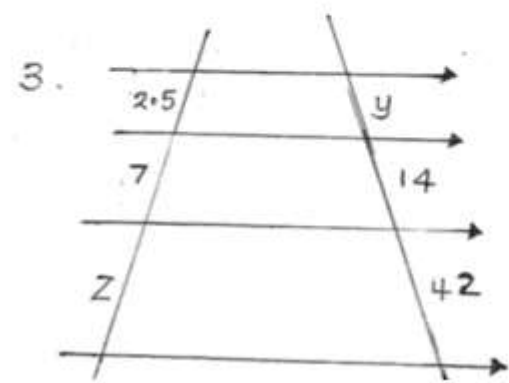


<https://www.youtube.com/watch?v=L9oYbpKLypE>




Exercises



Activity






1. Read the notes carefully and make your own notes in your math exercise book
2. Do the exercise given below.

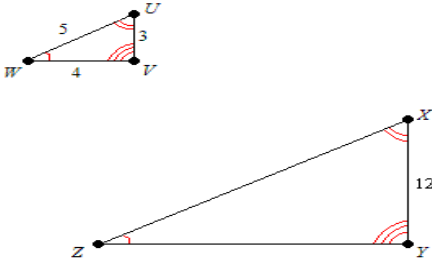


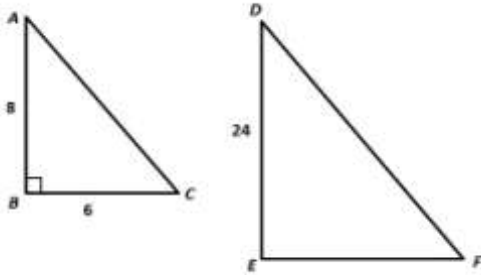
	<p><u>Exercise</u> Calculate the unknown sides</p> <p>1. </p> <p>2. </p> <p>3. </p>
 Assignment	<p>NOTE :</p> <p>It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.</p>
 Assessment	<p>Q 1.</p>

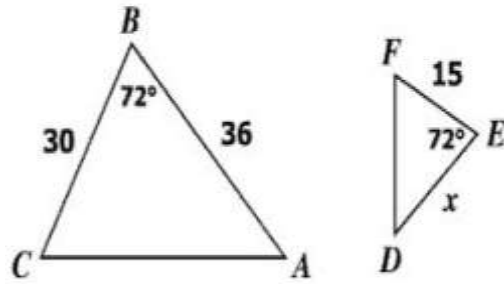
	<p>Calculate the length of Bc</p>
 <p>References</p>	<p>http://www.mathspadilla.com/2ESO/Unit2-Geometry/thales_theorem.html</p> <p>http://www.easy-math.net/intercept-theorem-ratio-theorem/</p> <p>https://geometryhelp.net/intercept-theorem/</p>

LESSON PLAN

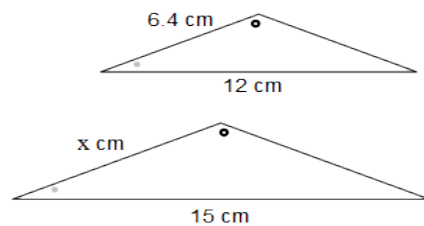
 <p>Teacher</p>	<p>Name : Mrs Henry</p> <p>Subject : Mathematics</p>
	<p>WEEK : 8</p>

<p>Date</p>	<p>Monday 06/07/20</p>
	<p>Topic : Similar Triangles 1 Lesson number : 2</p>
 <p>Learning outcomes</p>	<p>By the end of this lesson students should be able to:</p> <ul style="list-style-type: none"> Define similarity and solve similarity in triangles
 <p>Introduction</p>	<p><u>Similar Triangles</u></p> <p>Two triangles are said to be similar if their corresponding angles are congruent and the corresponding sides are in proportion .</p>
	<p>Catch phrase for the lesson 'Discovering Thales Theorem'</p>
 <p>Learners notes</p>	<p>Summary</p> <p>In other words, similar triangles are the same shape, but not necessarily the same size.</p> <p>The triangles are congruent if, in addition to this, their corresponding sides are of equal length.</p> <p>The side lengths of two similar triangles are proportional. That is, if $\triangle UVW$ is similar to $\triangle XYZ$, then the following equation holds:</p> $\frac{UV}{XY} = \frac{UW}{XZ} = \frac{VW}{YZ}$

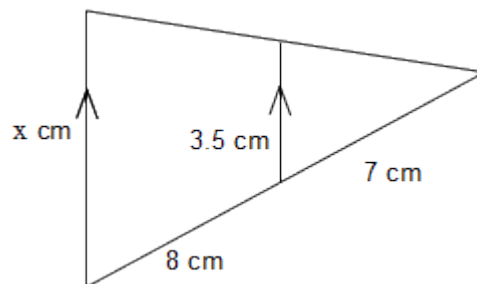
	<p>This common ratio is called the scale factor .</p> <p>The symbol \sim is used to indicate similarity.</p> <p>Example: $\triangle UVW \sim \triangle XYZ$. If $UV = 3$, $VW = 4$, $UW = 5$ and $XY = 12$, find XZ and YZ.</p>  $\frac{XZ}{5} = \frac{12}{3} \therefore XZ = 20 \quad \frac{12}{3} = \frac{YZ}{4} \therefore YZ = 16$
 Visual aids	https://www.youtube.com/watch?v=1UuiF3mskQA
 Exercises	<p><u>Activity</u></p> <ol style="list-style-type: none"> 1. Read the notes carefully and make your own notes in your math exercise book 2. $\triangle ABC \sim \triangle DEF$. $AB = 8$, $BC = 6$ and $DE = 24$. Find EF  <ol style="list-style-type: none"> 3. Find the value of DE.



4. Find the value of x .



5. Find the value of x .



Assignment

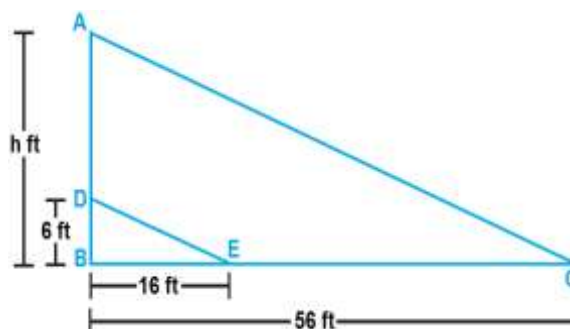
NOTE :

It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.




Assessment



Q1. In the diagram below, if $AC \parallel DE$, find the value of h .




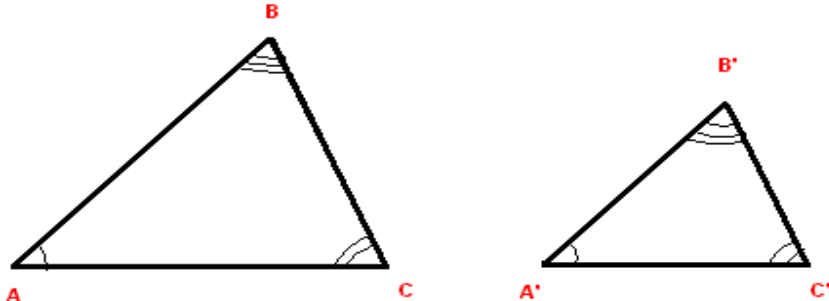




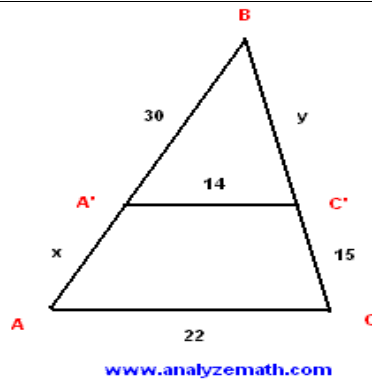
the diagram AC and DE parallel, find value of h .

 <p>References</p>	https://www.varsitytutors.com/hotmath/hotmath_help/topics/similar-triangles https://www.onlinemath4all.com/similar-triangles-worksheet.html

LESSON PLAN

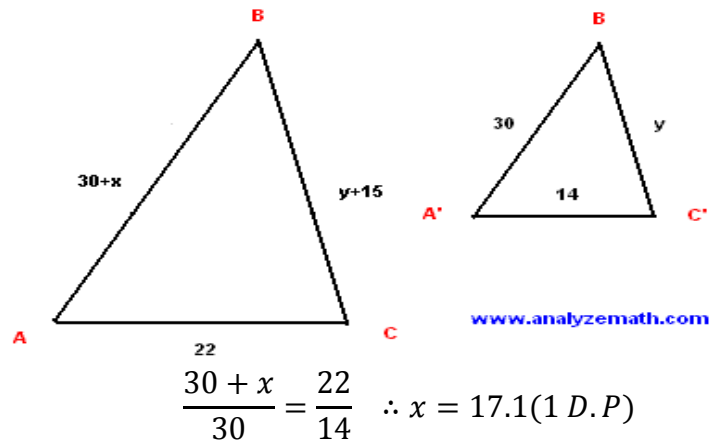
 <p>Teacher</p>	<p>Name : Mrs Henry Subject : Mathematics</p>
	<p>WEEK : 8</p>

<p>Date</p>	<p>Tuesday 07/07/20</p>
	<p>Topic : Similar Figures 2 Lesson number : 3</p>
 <p>Learning outcomes</p>	<p>By the end of this lesson students should be able to:</p> <ul style="list-style-type: none"> • Solve problems involving similar triangles.
 <p>Introduction</p>	<p>Two triangles ABC and A'B'C' are similar if the three angles of the first triangle are congruent to the corresponding three angles of the second triangle and the lengths of their corresponding sides are proportional as follows.</p> $\frac{AB}{A'B'} = \frac{BC}{B'C'} = \frac{AC}{A'C'}$ <div style="text-align: center;">  </div> <p style="text-align: right;">www.analyzemath.com</p>
	<p>Catch phrase for the lesson 'Sides of similar triangles are proportional'</p>
 <p>Learners notes</p>	<p>Summary To solve similar triangles problems, study the example below.</p> <p>Example 1 :</p> <p>In the triangle ABC shown below, A'C' is parallel to AC. Find the length y of BC' and the length x of A'A.</p>



SOLUTION:

Let us separate the two triangles.



Visual aids

<https://www.youtube.com/watch?v=YMSkiNuwmMU>

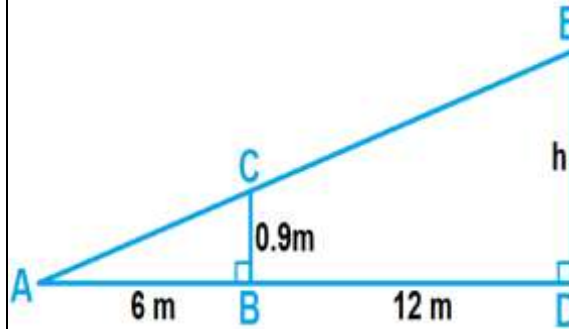
<https://www.onlinemathlearning.com/use-similar-triangles-hsg-srt5.html>



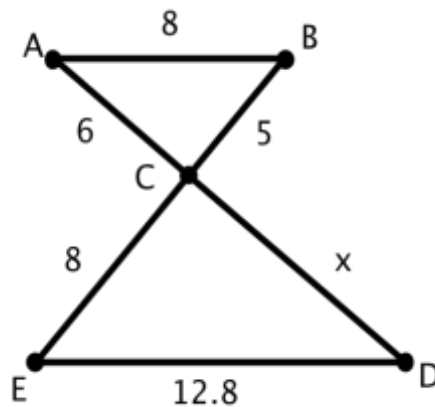
Exercises

Activity

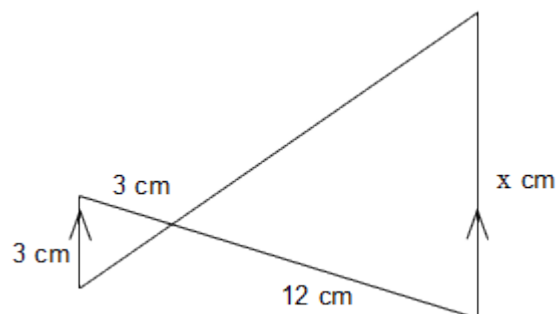
1. Read the notes carefully and make your own notes in your math exercise book.
2. Find the value of h in the given diagram below.



3. Find the value of x



4. Find the value of x .





Assignment

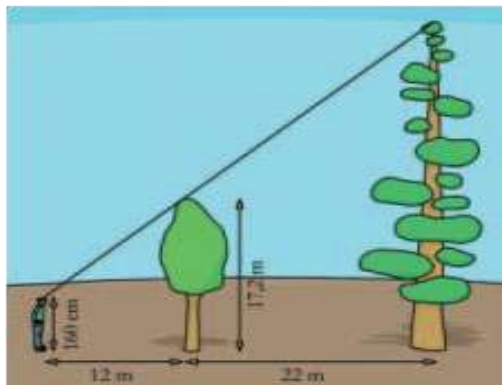
NOTE :

It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.

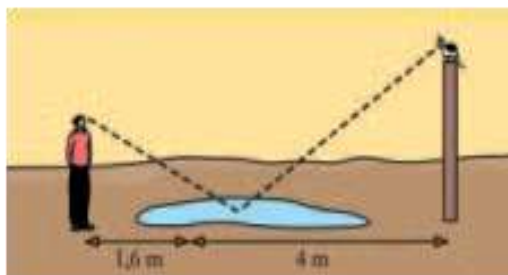


Assessment

Q 1. John is 160cm tall and he is standing 12 m away from a tree with a height of 172m. The taller tree is 22m away from the short tree. Calculate the height of the taller tree.



Q2. Leticia's cat has climbed on top of a post. Leticia can see its cat reflected in a puddle. If her eyes' height is 1.44 m, how tall is the post?



References







<https://www.onlinemath4all.com/similar-triangles-worksheet.html>

http://www.mathspadilla.com/2ESO/Unit2-Geometry/thales_theorem.html

<https://www.analyzemath.com/Geometry/similar-triangles-examples-and-problems-with-solutions.html>

<https://www.onlinemathlearning.com/use-similar-triangles-hsg-srt5.html>

LESSON PLAN

 Teacher	Name : Mrs Henry Subject : Mathematics
 Date	WEEK : 8 Wednesday 08/07/20
 	Topic : Linear Graph Lesson number : 1
 Learning outcomes	By the end of this lesson students should be able to: <ul style="list-style-type: none"> • Draw a set of x and y axes. • Plot coordinates accurately on a pair of axis.
 Introduction	<u>Linear Graph</u> Linear means straight and a graph is a diagram which shows a connection or relation between two or more quantity. So, the linear graph is nothing but a straight line or straight graph which is drawn on a plane connecting to points on x and y coordinates.
 	Catch phrase for the lesson ‘Life doesn’t move in straight lines’

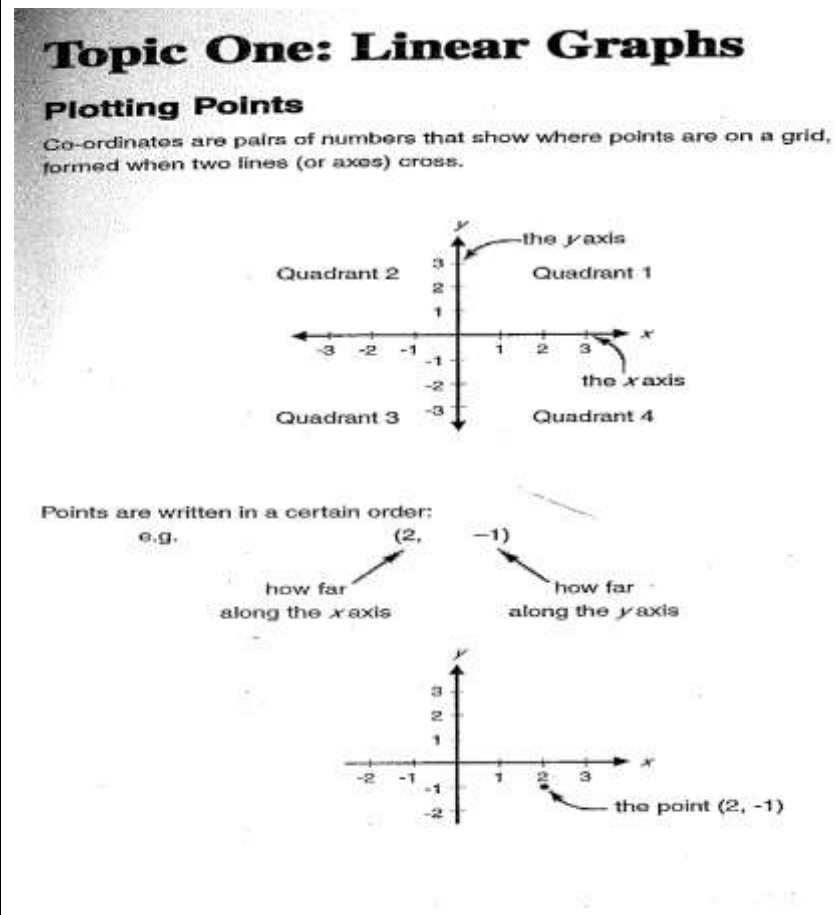


Summary

Plotting Points on a Graph

To plot a point, we need to have two things: a **point** and a **coordinate plane**.

Learners
notes



Visual aids

<https://www.youtube.com/watch?v=r16l6LB2YbQ>

<https://www.youtube.com/watch?v=4x6yaqsoDjE>

[Maths 9 Book 3](#)



Activity

1. Read the notes carefully and make your own notes in your math exercise book.
2. Do Exercise 1.1 (P. 5 – 8) – Q'S 1, 2, 3, 4

Exercise 1.1




1. (a) Draw up a set of x - y axes and mark the following points:
A (0,4) D (3, - 2) G (- 4, - 5)
B (2,1) E (4, - 5) H (- 3, - 2)
C (5,1) F (0, - 3) I (- 5, 1)
J (- 2, 1)
(b) Join the points with straight lines, A to B, B to C, C to D etc. finishing with J back to A.
2. (a) Draw up a set of x - y axes and mark the following points:
A (5,2) F (3, - 1) K (- 5, 3) Q (- 5, 5)
B (8,4) G (- 2, - 1) L (- 6, 2) R (- 5, 6)
C (5,1) H (- 2, - 4) M (- 8, 2) S (- 4, 5)
D (5, - 4) I (- 4, - 4) N (- 8, 3) T (- 2, 2)
E (3, - 4) J (- 4, 1) P (- 6, 5) U (5, 2)
(b) Join the points with straight lines, A to B, B to C, C to D etc. finishing with T to U.
3. (a) On a set of axes, mark the following points:
A (- 4, - 2) C (- 2, 0) E (0, 2) G (2, 4)
B (- 3, - 1) D (- 1, 1) F (1, 3) H (3, 5)
(b) Join the points, A to B, B to C etc.
(c) Describe the pattern you see.

4. Plot each of these points and then state whether the pattern is of a straight line :








(a) (- 2, - 4) (- 1, - 2) (0,0) (1,2) (2,4)

(c) (- 2,3) (- 1,3) (0,3) (1,3) (2,3)

(d) (- 2, - 5) (- 1, - 3) (0, - 1) (1,1) (2,3)

 Assignment	NOTE : It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.
 Assessment	<p>Q1. In each of the following groups, the points follow a straight line. Plot the points and then, using a ruler find the next two points in the pattern.</p> <p>(a) $(-3, 9)$ $(-2, 6)$ $(-1, 3)$ $(0, 0)$ $(1, -3)$ $(-, -)$ $(-, -)$</p> <p>(b) $(-3, 7)$ $(-2, 5)$ $(-1, -3)$ $(0, -1)$ $(1, 1)$ $(-, -)$ $(-, -)$</p>
 References	<p>https://byjus.com/maths/linear-graph</p> <p>Maths 9 Book 3</p> <p>https://www.chilimath.com/lessons/introductory-algebra/plotting-points-graph-xy-plane/</p>

LESSON PLAN

 Teacher	Name : Mrs Henry Subject : Mathematics
 Date	WEEK : 8 Thursday 09/07/20
	Topic : Graphing straight lines Lesson number : 2
 Learning outcomes	By the end of this lesson students should be able to: <ul style="list-style-type: none"> Establish the straight line property of linear function by graphing
 Introduction	<u>Graphing straight lines</u> Linear equations have graphs which are straight lines. The general equation of a linear is $y = mx + c$.
	Catch phrase for the lesson ‘Coordinates are used in GPS’
 Learners notes	Summary Some example of these equations are $y = 2x + 3$ where $m = 2$ and $c = 3$ $y = -5x + 4$ where $m = -5$ and $c = 4$ $y = x - 3$ where $m = -1$ and $c = -3$ $y = 0.2x$ where $m = 0.2$ and $c = 0$ $y = -x + 1$ where $m = -1$ and $c = 1$

These equations or rules help us find points so that we can plot the straight lines.

To find the points, we use a table of values which usually looks like this :

x	-3	-2	-1	0	1	2	3
y							

Example :

Graph the equation $y = 2x + 1$

Step 1 : Complete a table of value for the equation

$$y = 2x + 1$$

x	-2	-1	0	1	2
y	-3	3			

To complete the table of values, substitute each value of x into the equation, then multiply by 2 and add 1 to the result to get the y value.

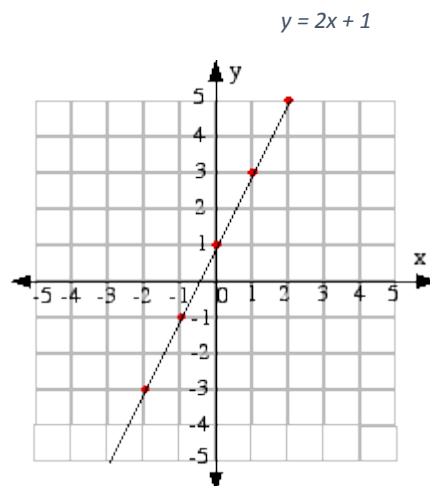
e.g. When $x = -2$, $y = 2 \times -2 + 1$

$$= -3 \quad \therefore \text{The point is } (-2, -3)$$





When $x = 1$, $y = 2 \times 1 + 1$

$$= 3 \quad \therefore \text{The point is } (1, 3)$$

Step 2 : Graph the line on a pair of axes



Step 3 : Label your graph

 Visual aids	https://www.youtube.com/watch?v=Byw72mbDBT8 https://www.youtube.com/watch?v=a6hlaNvWE78
 Exercises	<p><u>Activity</u></p> <ol style="list-style-type: none"> 1. Read the notes carefully and make your own notes in your math exercise book. 2. Do Exercise 1.2 (P. 5 – 8) – <p>Q1. Graph the following equations :</p> <p>(a) $y = 5x$ (a') $y = 3x$</p> <p>Q2. Draw a set of axes with x axis from -2 to 2 and y axis from -10 to 10. Plot the two graphs on this axes. Do these graphs have anything in common ?</p> <p>Q3. Graph the following equations :</p> <p>(b). $y = x + 5$ (d). $y = x - 3$</p> <p>Q4. Draw a set of axes with x axis from -2 to 2 and y axis from -10 to 10. Plot the two graphs on this axes. Do these graphs have anything in common ?</p> <p>Q5. Draw the graphs of :</p> <p>(a). $y = 3x - 2$ (b). $y = 2x + 3$ (d). $y = 3x - 4$</p> <p>Q6. Draw the graphs of the equation on one set of axes. Is there anything you notice about the graphs of</p>
 Assignment	<p>NOTE :</p> <p>It is important that you complete this exercise as this topic will be assessed later with an assignment and a test.</p>
 Assessment	<p>Q1. Draw up tables of values and then graph on the same set of axes.</p> <p>(a). $y = 2x - 2$ (b). $y = -2x - 2$ (c). $y = 2x + 2$ (d). $y = -2x + 2$</p> <p>Q2. Can you see any pattern or rule ?</p>



References

<http://bestmaths.net/online/index.php/year-levels/year-9/year-9-topics/straight-line-graphs/>

Maths 9 Book 3



WEEKLY CHECKLIST For Parents:

Term: 2 Week number 1 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 2 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 3 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 4 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 5 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 6 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 7 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 8 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 9 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 10 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 11 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 12 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				

Term: 2 Week number 13 Date..... to..... Month:

Subject	Number of lessons	Days	Tick when activity is complete	Parents comment	Signature
	1				
	2				
	3				
	4				
	5				
	6				