Erasmus+	Smart School for Smart Age Lesson plan - Erasmus +	
Subject: Mathematics	**Number of lessons: 5**	**Date:** March and April 2019
Teachers: Laurinda Barros and Luzia Novais		
Topic: Equation of a straight Line $\boldsymbol{y = ax + b}$		
Key words: GeoGebra - Equation - Straight Line – Slope – Computer - Socrative		

Lessons objectives:

It is intended to promote content manipulation involving the equations and respective graphical representation, more precisely:

- Graphical representation of a function, after knowing its equation;
- Study the monotony of a function;
- Relate the inclination to the monotony of the function;
- Calculate the intersection of the function graph with the coordinate axes;
- Find "m" and "b";
- Calculate the equation of a straight line;

Resources

- Computers with internet access;
- Multimedia projetos;
- Tablets with internet access;
- Mobile Phones with internet access.

Lessons sequence/activity

Task 1 – Equation of a straight Line $\boldsymbol{y = ax + b}$ (4 lessons)

Task 2 –Take a quiz with socrative (1 lesson)

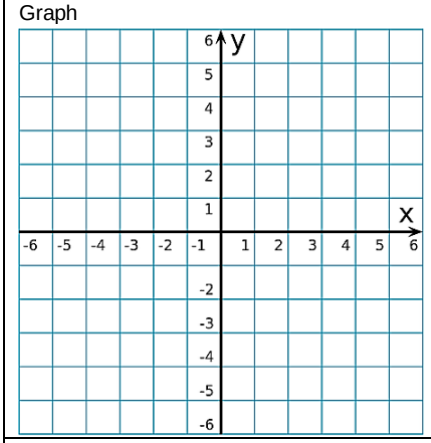
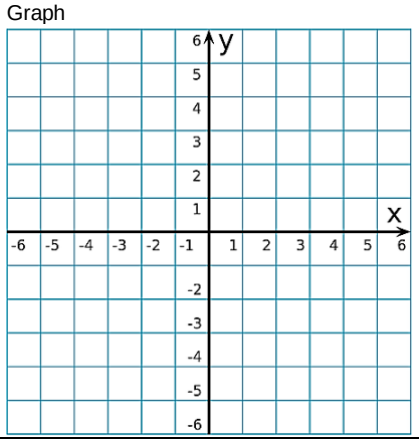
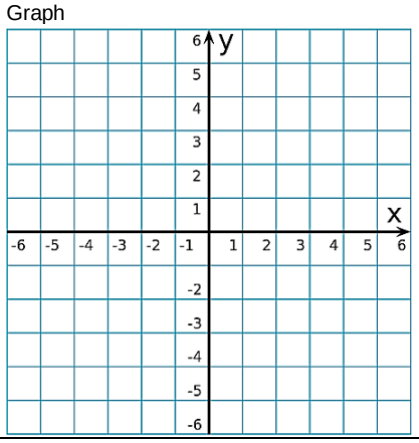
School António Correia de Oliveira	**PAIR WORK**
Mathematics	Equation of a Straight Line $\boldsymbol{y = ax + b}$

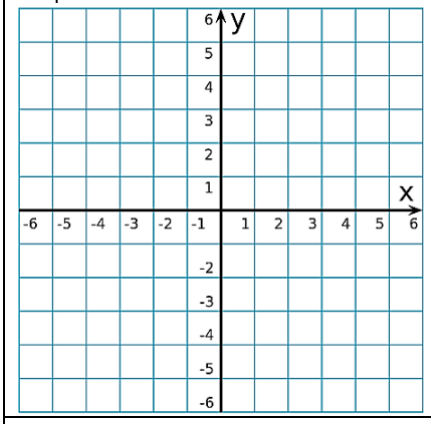
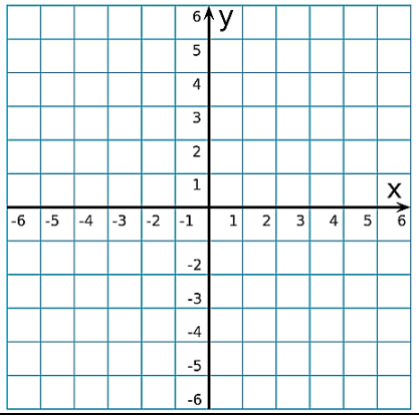
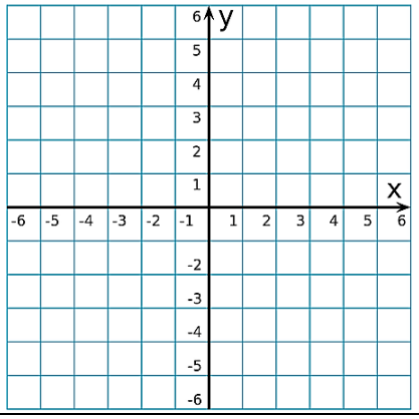
TASK 1

1. Constructs in *Geogebra* the functions graphs:

$$f(x) = 2x, \quad g(x) = -x, \quad h(x) = 10x, \quad i(x) = \frac{1}{2}x, \quad j(x) = -5x \quad \text{e} \quad k(x) = 2.$$

1.1. Sketch the graphics:

$f(x) = 2x$	$g(x) = -x$	$h(x) = 10x$
Graph 	Graph 	Graph 
Slope signal: _____ Monotony: _____	Slope signal: _____ Monotony: _____	Slope signal: _____ Monotony: _____

$i(x) = \frac{1}{2}x$	$j(x) = -5x$	$k(x) = 2$
Graph 	Graph 	Graph 
Slope signal: _____ Monotony: _____	Slope signal: _____ Monotony: _____	Slope signal: _____ Monotony: _____

1.2. How does parameter variation a affect Graphs in the family of functions defined by $y = ax$.

- What happens when we increase the absolute value of a?
- What happens when we decrease the absolute value of a?

1.3. What happens to Graph when the real number a is:

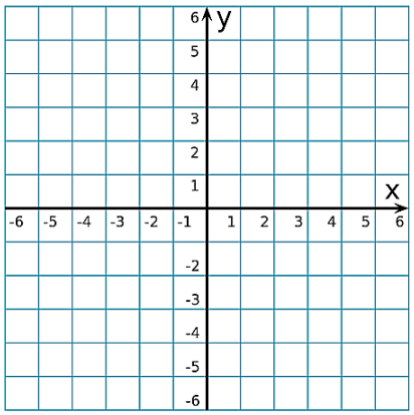
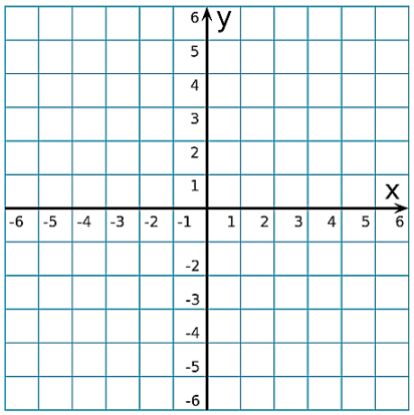
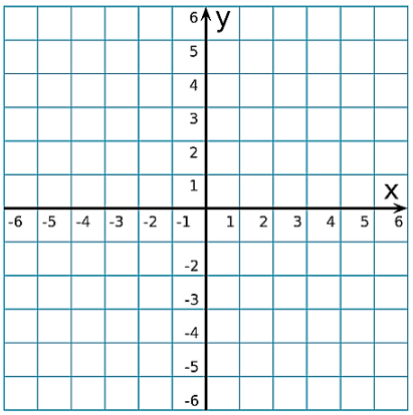
- Positive? Negative? Null?

TASK 2

2. Constructs in *Geogebra* the functions graphs:

$$f(x) = 2x, \quad g(x) = 2x + 3 \text{ e } \quad h(x) = 2x - 1.$$

2.1. Sketch the graphics:

$f(x) = 2x$	$g(x) = 2x + 3$	$h(x) = 2x - 1$
		

2.2. Complete the following table:

	$f(x) = 2x$	$g(x) = 2x + 3$	$h(x) = 2x - 1$
Slope a:			
y - intercept: b $P(0; b)$			
x - intercept Q$(x, 0)$			
Monotony (ascending / descending)			

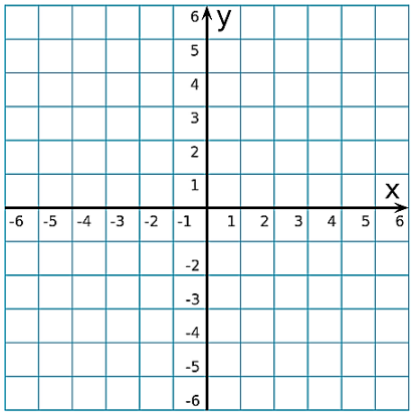
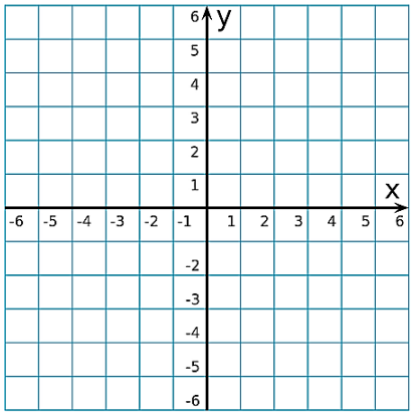
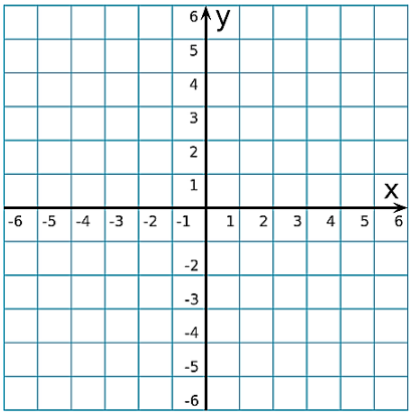
2.3. What is the relative position of three straight.

TASK 3

3. Constructs in *Geogebra* the functions graphs:

$$f(x) = -x,\ g(x) = -x + 3 \text{ e } h(x) = -x - 1.$$

3.1. Sketch the graphics:

$f(x) = -x$	$g(x) = -x + 3$	$h(x) = -x - 1$
		

3.2. Complete the following table:

	$f(x) = -x$	$g(x) = -x + 3$	$h(x) = -x - 1$
Slope a:			
y - intercept: b $P(0;\ b)$			
x - intercept Q$(x, 0)$			
Monotony (ascending / descending)			

3.3. What is the relative position of three straight.

3.4. How does the variation of parameter b affect the Graphs of the family of functions defined by $y = ax + b$.

- What happens to the line when we increase the value of b?
- What happens to the line when we decrease the value of b?

socrative

Equation of a Straight Line

Task 2

Ponto: _____

1. For the straight line y = -2x + 3, what are:
a) the slope
b) the y-intercept?

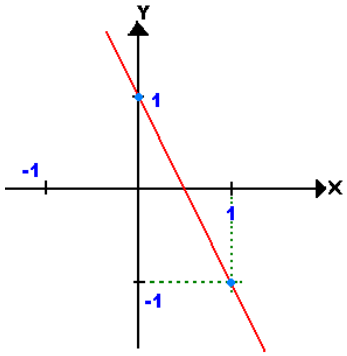
(A) a) Slope = 2
b) y-intercept = (0, -3)

(B) a) Slope = -2
b) y-intercept = (0, 3)

(C) a) Slope = 3
b) y-intercept = (0, -2)

(D) a) Slope = -3
b) y-intercept = (0, 2)

2. What is the equation of the straight line shown in the diagram?



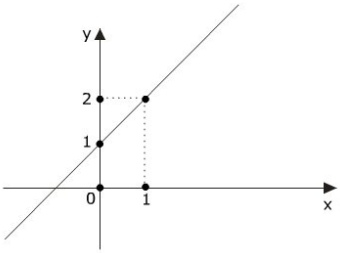
(A) y = x - 1

(B) y = -x + 1

(C) y=2x

(D) y=2x+1

3. What is the equation of the following line?



(A) y=2x+1

(B) y=-x+1

(C) y=-2x+1

(D) y=0,5x+1

(E) y=x+1

4. For the straight line x = 2y - 3, what are:
a) the slope
b) the y-intercept?

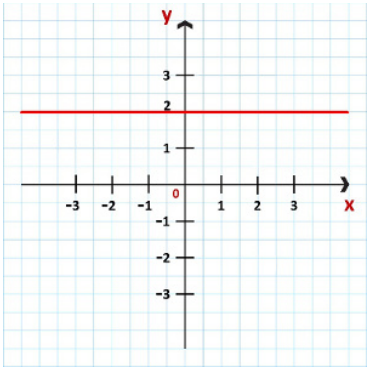
(A) Slope = 2 and y-intercept = (0, -3)

(B) Slope = ½ and y-intercept = (0, 1½)

(C) Slope = -½ and y-intercept = (0, 1½)

(D) Slope = ½ and y-intercept = (0, -1½)

5. What is the equation of the straight line shown in the diagram?



A) x=2

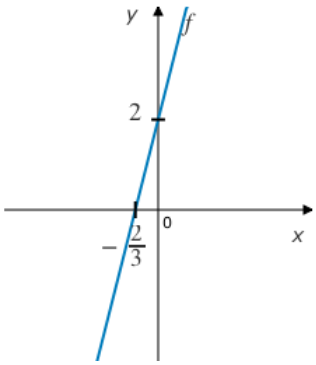
B) y=2x+2

C) y=2

D) y=2x

E) y=-2x+2

6. What is the equation of the straight line shown in the diagram?



A) y=-2/3x+2

B) y=2x-2/3

C) y=x+2

D) y=3x+2

E) y=-3x+2