Line equations	Season	01
	Episode	16
	Time frame	55 mins

Prerequisites : Basic algebra skills.

Objectives :
- Understand how an equation defines a line but also regions of the plane.
- Practise some computations with line equations.

Materials :
- *Slideshow.*
- *Equation and list of points for each team.*

1 – Find the right points — 25 mins

The group is divided into 4 teams. Each team is given a line equation and a list of 20 point coordinates (the same for every team). One member of each team goes to the board. He or she will place points on a coordinate graph according to the instruction of the team.
- Turn by turn, each team picks a pair of coordinates in the list and says it out loud. These are the coordinates of a point in the coordinate graph.
- Every team computes the result of its algebraic expression with the coordinates given. If the result is
  - equal to zero, the team places the point on the graph with a red cross ;
  - negative, the team places the point on the graph with a blue cross ;
  - positive, the team places on the graph with a green cross.

The first team to have three points of each colour wins and the game stops.
Scores are then computed in the following way :
- Three points for every red point.
- Two points for every blue or green point.

2 – Speed contest — 25 mins

Each team is given a list of equations. For each equation, they have to find :
- the coordinates of three points on the set defined by this equation ;
- the shape of the set.

They can study the equations in the order they want.
The first team to give the correct answers about one equation wins 5 points.

3 – Grading — End of session

At the end of the session, the team with the most points gets an A*, the second team an A, the third team a B.

Line equations	Season	01
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	Document	Team 1

Your expression : $-2x + 6y - 6$.

Twenty pairs of coordinates.

$(-2, 3)$	$(1, 1)$	$(4, -1)$	$(3, 2)$	$(0, 1)$
$(-3, 0)$	$(-4, -1)$	$(-1, 1)$	$(2, 3)$	$(0, 2)$
$(1, 4)$	$(-2, -2)$	$(-4, 2)$	$(2, -2)$	$(-2, 5)$
$(5, 4)$	$(4, 1)$	$(1, -1)$	$(-3, 1)$	$(0, -1)$

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Your expression : $4x - 6y + 10$.

Twenty pairs of coordinates.

$(-2, 3)$	$(1, 1)$	$(4, -1)$	$(3, 2)$	$(0, 1)$
$(-3, 0)$	$(-4, -1)$	$(-1, 1)$	$(2, 3)$	$(0, 2)$
$(1, 4)$	$(-2, -2)$	$(-4, 2)$	$(2, -2)$	$(-2, 5)$
$(5, 4)$	$(4, 1)$	$(1, -1)$	$(-3, 1)$	$(0, -1)$

Line equations	Season	01
	Episode	16
	Document	Team 3

Your expression : $4x - 2y + 4$.

Twenty pairs of coordinates.

$(-2, 3)$	$(1, 1)$	$(4, -1)$	$(3, 2)$	$(0, 1)$
$(-3, 0)$	$(-4, -1)$	$(-1, 1)$	$(2, 3)$	$(0, 2)$
$(1, 4)$	$(-2, -2)$	$(-4, 2)$	$(2, -2)$	$(-2, 5)$
$(5, 4)$	$(4, 1)$	$(1, -1)$	$(-3, 1)$	$(0, -1)$

Line equations	Season	01
	Episode	16
	Document	Team 4

Your expression : $2x + 3y - 5$.

Twenty pairs of coordinates.

$(-2, 3)$	$(1, 1)$	$(4, -1)$	$(3, 2)$	$(0, 1)$
$(-3, 0)$	$(-4, -1)$	$(-1, 1)$	$(2, 3)$	$(0, 2)$
$(1, 4)$	$(-2, -2)$	$(-4, 2)$	$(2, -2)$	$(-2, 5)$
$(5, 4)$	$(4, 1)$	$(1, -1)$	$(-3, 1)$	$(0, -1)$

Line equations	Season	01
	Episode	16
	Document	15 equations

For each equation find out :
- the coordinates of three points on the set defined by this equation ;
- the shape of the set.

You can study the equations in the order you want.
Whenever you think you have a complete answer, call the teacher to check and win 5 points if it's right.

$$\begin{array}{ccc} x^2+y^2-1=0 & 3x-y+2=0 & 2x^2+y=0 \\ xy=6 & -x+4y=0 & y-\sqrt{x}=2 \\ x+y=7 & \sqrt{x+2}=6 & -3x-y-7=0 \\ x^2-y^2=5 & -\frac{x}{2}-2y=0 & -\frac{4}{x}-2y=0 \\ -2x^2-y-7=0 & \frac{1}{x}+\frac{1}{y}=0 & -x-y+1=0 \end{array}$$

Line equations	Season	01
	Episode	16
	Document	15 equations

For each equation find out :
- the coordinates of three points on the set defined by this equation ;
- the shape of the set.

You can study the equations in the order you want.
Whenever you think you have a complete answer, call the teacher to check and win 5 points if it's right.

$$\begin{array}{ccc} x^2+y^2-1=0 & 3x-y+2=0 & 2x^2+y=0 \\ xy=6 & -x+4y=0 & y-\sqrt{x}=2 \\ x+y=7 & \sqrt{x+2}=6 & -3x-y-7=0 \\ x^2+y^2=5 & -\frac{x}{2}-2y=0 & -\frac{4}{x}-2y=0 \\ -2x^2-y-7=0 & \frac{1}{x}+\frac{1}{y}=0 & -x-y+1=0 \end{array}$$