

An Introduction To Explor...

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Edited with love by Mark Clark and Desmos Teaching Faculty

[linear](#), [slope](#), [rate of change](#), [intercept](#), [slider](#), [calculator](#)

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ABOUT THIS ACTIVITY

Use this lesson to acquaint your students with the Desmos graphing interface, and to review procedures and language around linear functions.

YOUR PAST SESSIONS

CODE	STUDENTS	RUN DATE
X59E	19 students	Feb 3, 2016 at about 9:30 am

SCREENS [preview](#)

- 1. Move the slider for m (blu...)
- 2. Question 1
As you change the slider for "m,"

- 3. Now change the "b" slide...
- 4. Question 2
As you change the slider for "b,"


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5. Graph the line $y = 3x - 4$...

6. Question 3

What do you think is true about any line that is parallel to " $y = 3x - 4$ "?



7. Now use the sliders to ch...

8. Question 4

What do you think is true about all the equations of lines that cross the y-axis in this place?



9. Type (0, 3) in row 4. Type ...

10. Question 5

What is the equation of the line?



11. Plot the points (0, -2) an...

12. Question 6

What is the equation of the line?



13. Plot the points (0, -3) an...

14. Question 7

What is the equation of the line?



15. Finally, plot the points (0,...

16. Question 8

What is the equation of the line?



17. Congratulations!

You have just completed your first Desmos investigation! Give yourself a pat on the back! You earned it!

STUDENT SCREEN PREVIEW



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Move the slider for m (blue dot in row 2) and think about what changing the m -value does to the graph.

Graphing interface showing a coordinate plane with a red line $y = mx + b$. The x-axis ranges from -10 to 2, and the y-axis ranges from -4 to 6. The line passes through the points $(-10, -10)$ and $(0, 1)$.

Control panel on the left:

- 1 $y = mx + b$ (Close)
- 2 $m = 1$ (Slider from -10 to 10) (Close)
- 3 $b = 1$ (Slider from -10 to 10) (Close)

Additional controls: +, undo, redo, settings, zoom in, zoom out, keyboard shortcuts.

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Question 1

As you change the slider for "m," what features of the line stay the same and what features change? (You should mention what happens when m is large, small, and negative.) You can go back to the previous screen if you want to play with the graph more.

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Now change the "b" slider below and think about what changing the b-value does to the graph.

+

1	$y = mx + b$	
2	$m = 1$	
	-10 10	
3	$b = 1$	
	-10 10	

+ **-**

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Question 2

As you change the slider for "b," what features of the line stay the same and what features change? You can go back to the previous screen if you want to play with the graph more.

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Graph the line $y = 3x - 4$ by typing it into row 4. Then use the sliders in rows 2 and 3 to change the values of "m" and "b" to make a parallel line.

1 $y = mx + b$

2 $m = 1$
-10 10

3 $b = 1$
-10 10

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Question 3

What do you think is true about any line that is parallel to " $y = 3x - 4$ "?

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Now use the sliders to change the values of "m" and "b" so that the red line crosses the y-axis at the same point as the purple line.

+

1	<input type="radio"/>	$y = mx + b$	
2	<input type="radio"/>	$m = 1$	
		-10	10
3	<input type="radio"/>	$b = 1$	
		-10	10
4	<input type="radio"/>	$y = 3x - 4$	

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Graphing grid showing two lines: a red line $y = mx + b$ and a purple line $y = 3x - 4$. The red line passes through the y-axis at $y = 1$. The purple line passes through the y-axis at $y = -4$. The x-axis ranges from -10 to 10, and the y-axis ranges from -6 to 6.

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Question 4

What do you think is true about all the equations of lines that cross the y-axis in this place?

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Type (0, 3) in row 4. Type (2, 11) in row 5. Now use the sliders to change the values of "m" and "b" so the line goes through both points.

Desmos graphing calculator interface showing a linear equation editor and a coordinate plane.

Equation Editor:

- Row 1: $y = mx + b$
- Row 2: $m = 1$ (Slider range: -10 to 10)
- Row 3: $b = 1$ (Slider range: -10 to 10)
- Row 4: (Empty)

Graph: A coordinate plane with a red line passing through the origin (0, 0) and the point (2, 11). The x-axis is labeled from -5 to 5, and the y-axis is labeled from 0 to 10.

Tools: A toolbar on the right includes a wrench icon, a plus sign, a minus sign, and a home icon. A keyboard icon is located at the bottom right.

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Question 5

What is the equation of the line?

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Plot the points $(0, -2)$ and $(4, 6)$. Adjust "m" and "b" until your line passes through both points.

Desmos graphing calculator interface showing a coordinate plane with a red line. The x-axis ranges from -10 to 2, and the y-axis ranges from -4 to 6. A red line is plotted, passing through the points $(0, -2)$ and $(4, 6)$. The line has a positive slope and a positive y-intercept.

On the left side, there is a list of equations and parameters:

- 1 $y = mx + b$
- 2 $m = 1$
- 3 $b = 1$

Each equation has a play button and a close button (X). The parameters for m and b are currently set to 1. The Desmos logo is visible at the bottom left of the interface.

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Question 6

What is the equation of the line?

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Plot the points $(0, -3)$ and $(-2, 7)$. Adjust "m" and "b" until your line passes through both points.

The interface shows a coordinate plane with a grid. The x-axis ranges from -10 to 2, and the y-axis ranges from -4 to 6. A red line is plotted, passing through the points $(0, -3)$ and $(-2, 7)$. On the left side, there is a control panel with three rows:

1	$y = mx + b$	×
2	$m = 1$	×
3	$b = 1$	×

Each row has a play button icon and a numerical input field. The input field for m contains -10 and for b contains 10 . At the bottom left, there is a "powered by desmos" logo. At the bottom right, there is a keyboard icon and an upward arrow icon.

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Question 7

What is the equation of the line?

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Finally, plot the points $(0, -5)$ and $(10, 0)$. Adjust "m" and "b" until your line passes through both points.

+

1	<input type="radio"/> $y = mx + b$	
2	<input type="radio"/> $m = 1$ -10 10	
3	<input type="radio"/> $b = 1$ -10 10	

+ **-**

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Question 8

What is the equation of the line?

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