

**A. Lesson Context**

BIG PICTURE of this UNIT:	<ul style="list-style-type: none"> <li>• What is meant by the term FUNCTIONS and how do we work with them?</li> <li>• mastery with working with basics &amp; applications of linear functions</li> <li>• mastery with working with basics &amp; applications of linear systems</li> <li>• understanding basics of function concepts and apply them to lines &amp; linear systems</li> </ul>		
CONTEXT of this LESSON:	<p>Where we've been</p> <p>In Lessons 1 – 4 we have been practicing a lot with the different linear ideas.</p>	<p>Where we are</p> <p>Starting to think about our Final Project. Directions In Another Language.</p>	<p>Where we are heading</p> <p>How do we apply the concept of “functions” to linear &amp; exponential relations.</p>

In this assignment you will be creating a picture using Mathematical directions. It needs to contain at least 40 different lines. The picture at right is an example of what I expect...

There are three major parts to this project. Please complete all three. Get started.

**PART 1: The design.** You will create a design. This design will be accurate and neat

**PART 2: The poster.** We want you to create an awesome poster that displays your picture, along with the directions sheet. This should be very very neat, and easy to see from a distance.

**PART 3: The directions sheet.** You will be writing mathematical directions for this picture. I will give you an example below. In the language you need to have statements like...

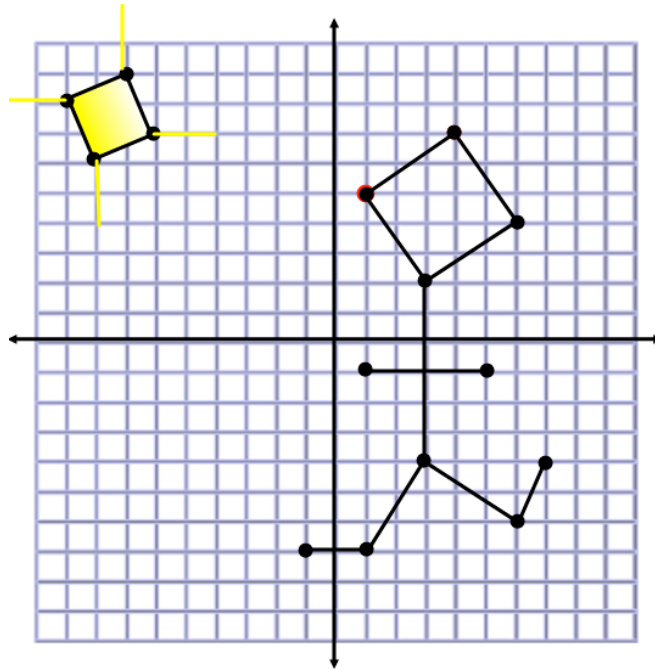
Direction Requirements

- Ex. 1: Has a slope of “m” and goes through the point (x,y).
- Ex. 2: Goes through the points (x<sub>1</sub>, y<sub>1</sub>) and (x<sub>2</sub>, y<sub>2</sub>).
- Ex. 3: Is Parallel to Line # and goes through the point (x,y)
- Ex. 4: Is Perpendicular to Line # and goes through the point (x,y)
- Ex. 5: Is a vertical Line that goes through the point (x,y)
- Ex. 6: Is a horizontal Line that goes through the point (x,y)
- You must have lines in ALL FORMS: ... **Slope/Intercept form  $y = mx + b$**  and **Point/Slope form  $y - y_1 = m(x - x_1)$**  & **STANDARD FORM  $Ax + By = C$**

You try! Open up desmos and see if you can following the “DIRECTIONS IN ANOTHER LANGUAGE” and create the picture.

<b>Line 1:</b> Has a slope of $-\frac{2}{3}$ and goes through the point (1,5)		
Domain: $1 \leq x \leq 4$	Range: $2 \leq y \leq 5$	Equation: $y - 5 = -\frac{2}{3}(x - 1)$
<b>Line 2:</b> Is <b>perpendicular</b> to Line 1 and goes through the point (1,5)		
Domain: $4 \leq x \leq 6$	Range: $5 \leq y \leq 7$	Equation: $y - 5 = \frac{3}{2}(x - 1)$
<b>Line 3:</b> Is <b>parallel</b> to Line 1 and goes through the point (3,2)		
Domain: $3 \leq x \leq 6$	Range: $4 \leq y \leq 7$	Equation: $y - 2 = -\frac{2}{3}(x - 3)$
<b>Line 4:</b> Is perpendicular to Line 3 and goes through the point (3,2)		
Domain: $1 \leq x \leq 3$	Range: $2 \leq y \leq 4$	Equation: $y - 2 = \frac{3}{2}(x - 3)$
<b>Line 5:</b> Is perpendicular to the equation $y=5$ and goes through the point (3,-1)		
Domain: $x = 3$	Range: $2 \leq y \leq -4$	Equation: $x = 3$
<b>Line 6:</b> Is perpendicular to Line 5 and goes through the point (1,-1)		
Domain: $1 \leq x \leq 5$	Range: $y = -1$	Equation: $y = -1$
<b>Line 7:</b> Is goes through the two points (1,-7) and (3,-4)		
Domain: $1 \leq x \leq 3$	Range: $-7 \leq y \leq -4$	Equation: $y + 4 = \frac{3}{2}(x - 3)$
<b>Line 8:</b> Is goes through the two points (3,-4) and (-6,-6)		
Domain: $3 \leq x \leq 6$	Range: $-6 \leq y \leq -4$	Equation: $y + 4 = -\frac{2}{3}(x - 3)$
<b>Line 9:</b> Has a slope of 2 and goes through the point (7,-4)		
Domain: $6 \leq x \leq 7$	Range: $-6 \leq y \leq -4$	Equation: $y + 4 = 2(x - 7)$
<b>Line 10:</b> Is parallel to the x-axis and has a y-intercept of -7		
Domain: $6 \leq x \leq 7$	Range: $y = -7$	Equation: $y = -7$

Here is what is should have come out to look like. Compare your work with the solution below  
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Your job for the rest of class is to brainstorm your own design that you will eventually create directions for... similar to the ones we have given you in this example. There are some important criteria, the most important being the “complexity” of your design. Don't make it too easy. Also it cannot be a simple design, but must be a re-creation of something that is real. i.e. a dude standing on a sunny day.