

The MAIN POINT to this lesson is to INTRODUCE & REVIEW linear relations concepts you have already been presented in grades 9 & 10. Subsequent lessons will be devoted to PRACTICING & APPLYING these fundamental skills/concepts

(A) Lesson Objectives

- a. Review forms of Linear Equations → (i) Slope-Intercept form & (ii) Standard/General Form
- b. Write linear equations in both forms given
 - i. Slope & Point
 - ii. 2 Points
 - iii. Graph
 - iv. Data Table
- c. Graphing linear equations using:
 - i. Graph paper
 - ii. TI-84

(B) Equations in an Algebraic Context: In order to write the equation of a line, you need to know: _____.

(C) EXAMPLES for Practice

EX 1. Determine the equation of a line passing through A(-2,6) having a slope of $-\frac{1}{4}$

Using $y = mx + b$	Using $m = \frac{y - y_1}{x - x_1}$	Graphic/Numeric Verification:
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EX 2. Determine the equation of a line passing through A(-1,3) and B(2,7)

Using $y = mx + b$	Using $m = \frac{y - y_1}{x - x_1}$	Graphic/Numeric Verification:
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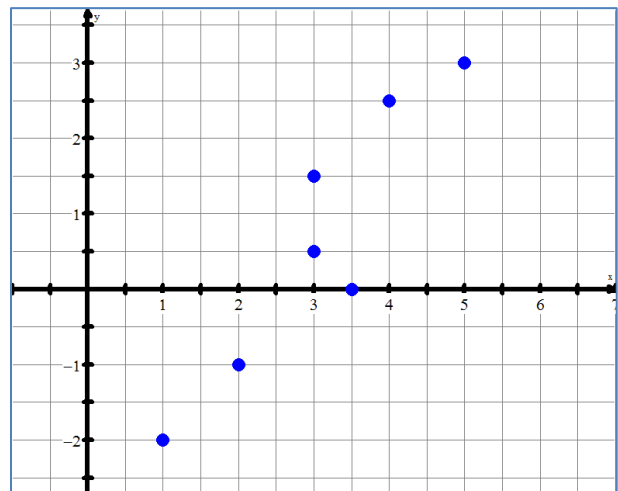
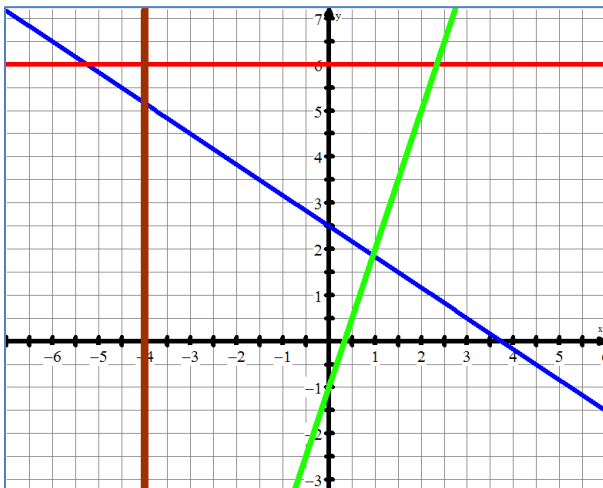
EX 3. Determine the equation of the line through A(4,-2) which is parallel to the line $2x - 4y = 8$. First, start with a visualization of the problem.

Using $y = mx + b$	Using $m = \frac{y - y_1}{x - x_1}$	Graphic/Numeric Verification:
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EX 4. Determine the equation of the line through A(4,-2) which is perpendicular to the line $2x - 4y = 8$. First, start with a visualization of the problem.

Using $y = mx + b$	Using $m = \frac{y - y_1}{x - x_1}$	Graphic/Numeric Verification:
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EX 5. Determine the equations of the lines whose graphs is given below:



a. EX 4. Determine the equation of the line whose data table is given below:

x	1	3	5	9
y	6	5	4	2

x	-1	1	4	10
y	-5	-1	5	17

b. Further examples:

(D) Equations in a Modeling/Application Context

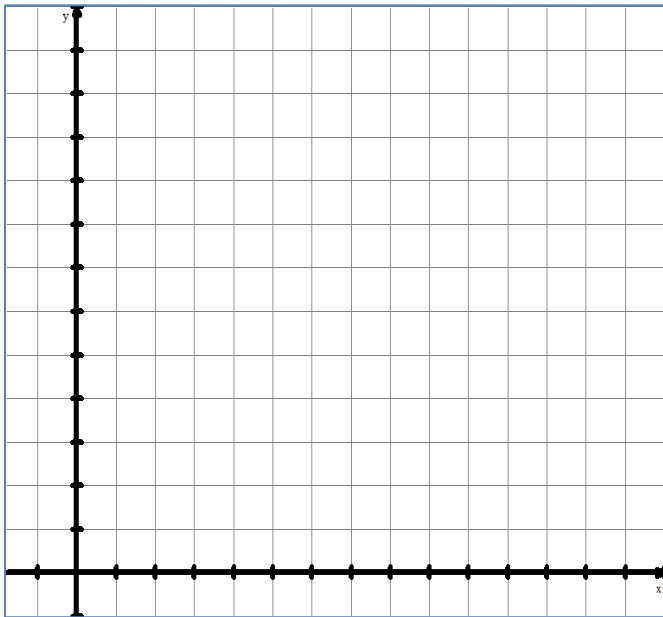
Verbal Description:

A woodworker sells rocking horses. His startup costs (including tools, plans, advertising) total \$50,000. Labour and materials cost him \$350 for each horse.

Data Table:

x			
y			

Graph:



Equation:

Slope:

Meaning of Slope:

Y-intercept:

Meaning of y-intercept :

x-intercept:

Meaning of x-intercept :

Questions:

- (a) How much does it cost her to make 12 rocking horses?

- (b) If her total annual expenses were \$93,750 last year, how many rocking horses did she make this past year?

- (c) How much should she charge customers for a rocking horse. Justify your choice of selling price.

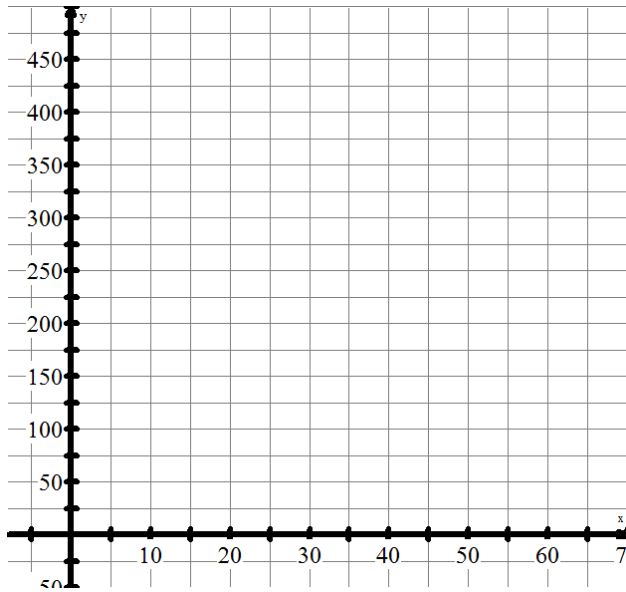
Verbal Description:

The amount of CO₂ (in ppm) in the air at the Mauna Loa Astronomical Observatory has been measured regularly since 1959. In 2000, the amount of CO₂ recorded was 369.40 ppm while in 2012, the amount was 389.78 ppm.

Data Table:

Years since 1960			
CO ₂ amount (in ppm)			

Graph:



Equation:

Slope:

Meaning of Slope:

Y-intercept:

Meaning of y-intercept :

Questions:

- (a) When will the CO₂ levels be at 600 ppm?
- (b) What was the amount of CO₂ in the air in June of this year?
- (c) If I give you an additional data point, (in the year 2005, the measured amount was 379.78), will your equation change? Why? How?
- (d) Interpret the statement “The 2005 rate of increase was 2.14 PPM per year”