



Warm Up! $y = mx + b$

Write the equation of a line with the given information.

	Slope	y-intercept	Equation
a)	-2	1	
b)	$\frac{2}{3}$	-4	
c)	5	0	
d)	$-\frac{3}{2}$	3	
e)	0	2	
f)	undefined	x-int = -5	

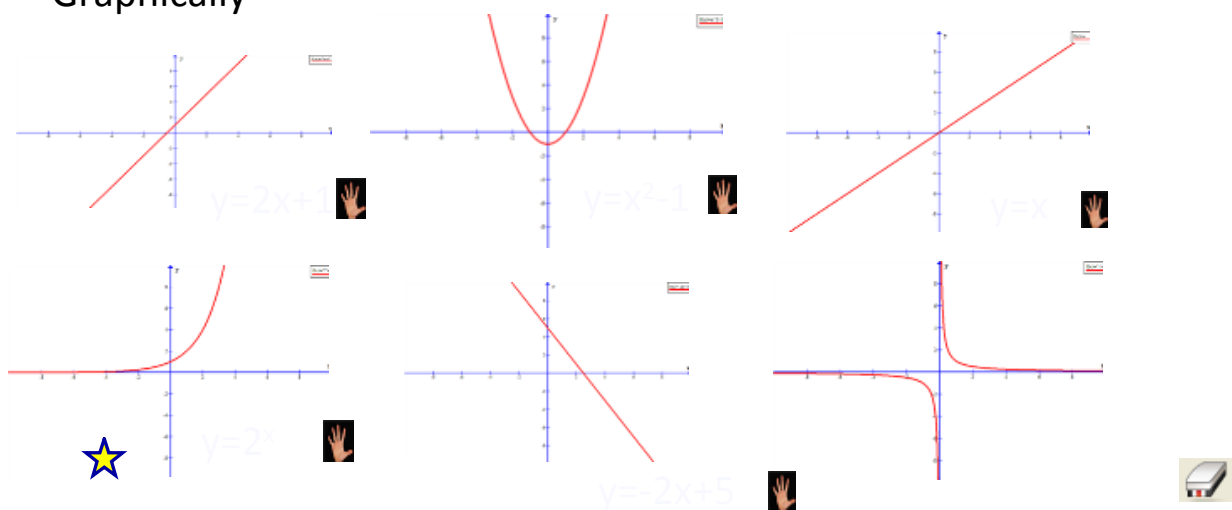
4.4 Standard Equations: Linear versus Non-Linear

How can you tell the difference between linear and non-linear?

I Numerically - First Differences

- linear: first differences are constant (for constant Δx)
- non-linear: first differences are not constant

II Graphically



III Algebraically - Equations

Look at the above equations.

Linear	Non-linear

Pull

All linear equations can be written in the form $y = mx + b$ (or $y = b$ or $x = a$).

Ex. 1 Linear or Non-linear?

a) $y = -4x - 2$

b) $y = 2x^2 + 1$

c) $2x - 3y + 4 = 0$



Notice that a linear equation can be written in different ways....

Forms of Linear Equations

The Slope/y-intercept Form

$$y = mx + b$$

slope

y-int

Ex. $y = 3x - 2$

Standard Form

$$Ax + By + C = 0$$

Rules:

- 1) One side must be equal to 0
- 2) "A" must be positive
- 3) No fractions or decimals

Ex. $3x - y - 2 = 0$

Ex. 2 Change into standard form

a) $y = 5x + 1$

b) $y = \frac{2}{5}x + \frac{1}{3}$

Ex.3 Find the slope and y-intercept for each of the following.

a) $y = 4x + 2$

b) $y = -2x$

c) $y = \frac{-1}{2}x - 1$

d) $3x + y - 4 = 0$

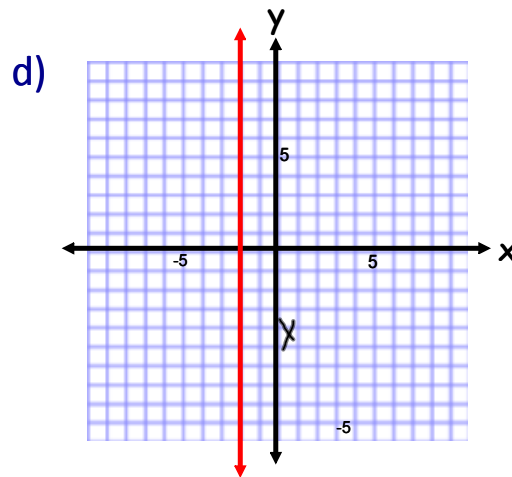
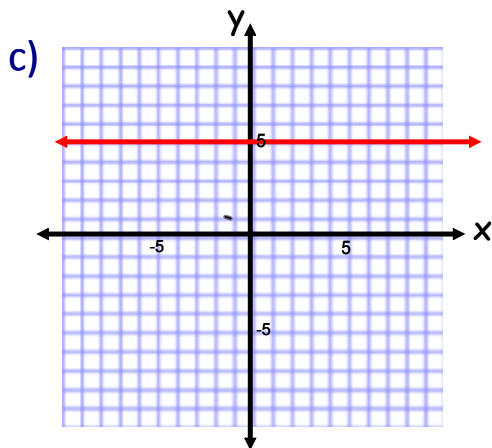
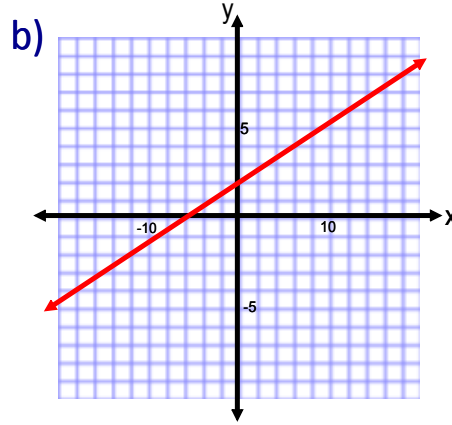
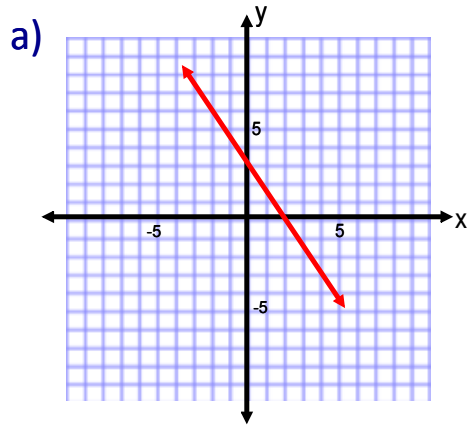
e) $y = 2$

f) $3x + 2y - 16 = 0$

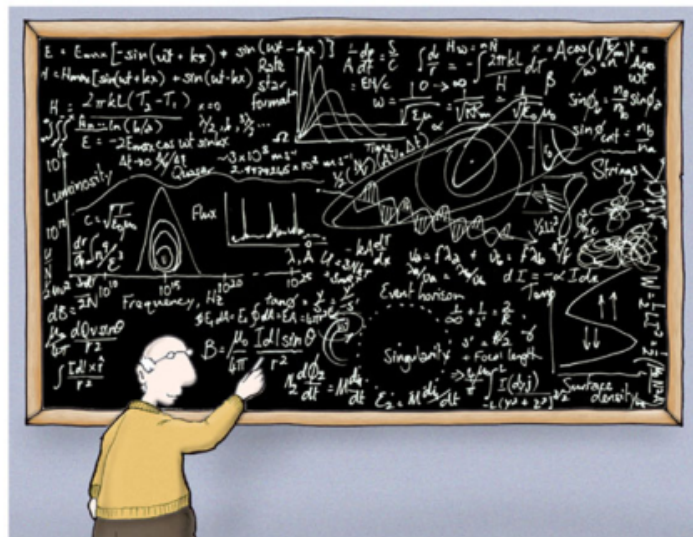
g) $x = -5$

h) $3(x - 1) - y + 8 = 0$

Ex. 4 i) Find the slope and y-intercept
 ii) Write the equation of each line in standard form.



Homework
page 305 #6 (no graph), 10, 15
page 312 #C1, C2, 1, 4, 5, 7



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