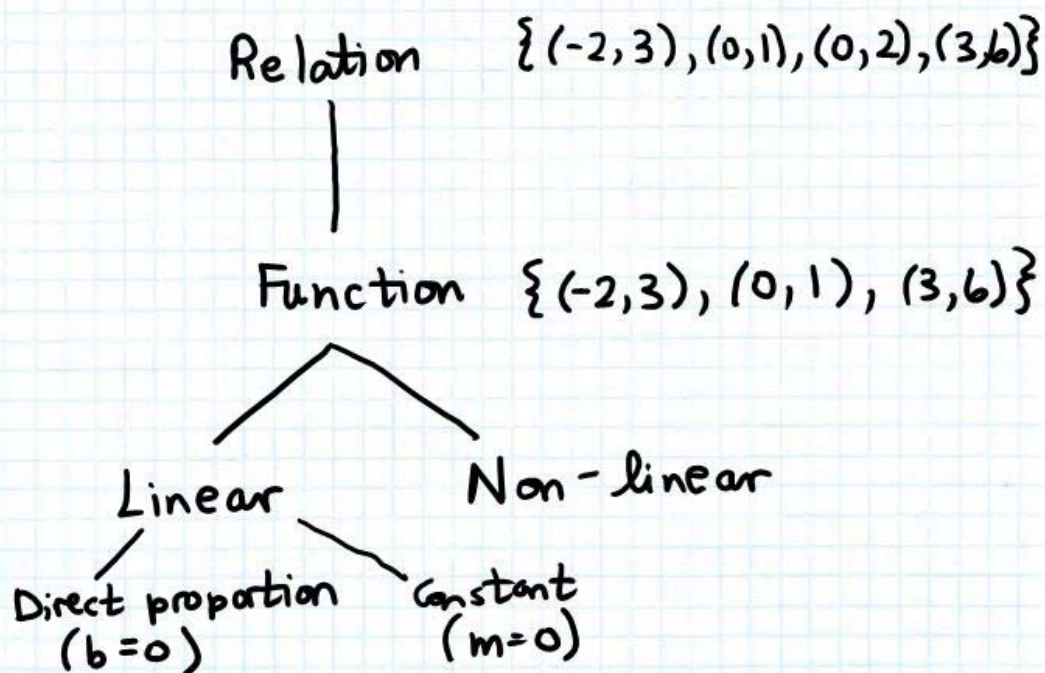
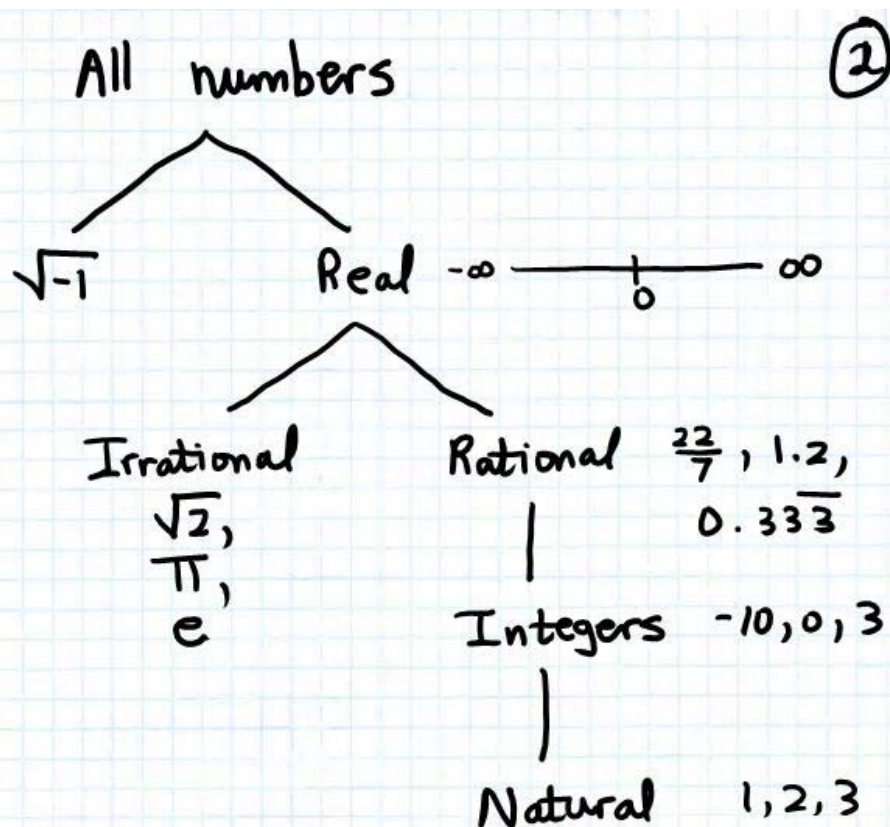


Name: _____ Page Number: 1
 Class: Math 1301 Date: 2-12-13
 Topic/Section: Section 1.4
Introduction to Linear Functions

Examples and Vocabulary	Notes/Comments/Questions
<u>Three Fundamental Properties of Linear Functions (Lines)</u> 1) Formula can be written as $y = f(x) = mx + b$ 2) Graph is a straight line. 3) When the input increases by a steady amount, the output changes by a steady amount also. <u>The slope or rate of change is the change in the output when the input increases by 1 unit.</u>	Why do we define linear functions in 3 different ways? How is each definition useful?



Name: _____ Page Number: 3
 Class: Math 1301 Date: 2-12-13
 Topic/Section: _____

Examples and Vocabulary	Notes/Comments/Questions
① Which of the following functions are linear? $y = f(x) = mx + b$ ✓ a. $f(x) = 3x - 5$ $m = 3$ $b = -5$ X b. $f(x) = \frac{3x-5}{x+2}$ ✓ c. $f(x) = \frac{5-3x}{2} = \frac{5}{2} - \frac{3}{2}x$ $m = -\frac{3}{2}$ $b = \frac{5}{2}$ ✓ d. $f(x) = \frac{3}{2}x$ $m = \frac{3}{2}, b = 0$ ✓ e. $f(x) = -5 = 0x - 5$ $m = 0, b = -5$ X f. $f(x) = \sqrt{x+3}$ ✓ g. $f(x) = x + \sqrt{3}$ $m = 1, b = \sqrt{3}$ X h. $f(x) = mx^2 + b$	

Name: _____ Page Number: 4
 Class: Math 1301 Date: 2-12-13
 Topic/Section: _____

Examples and Vocabulary

Notes/Comments/Questions

② Which of the following functions are linear?

a. ✓

x	0	5	10	15	20
y	-4	-2	0	2	4

slope = ?

b. X

x	-3	0	3	6	9
y	5	7	10	14	19

c. ✓

x	0	1	2	3	4
y	11	11	11	11	11

slope = 0

d. X

x	0	1	2	2	4
y	-4	-2	0	2	4

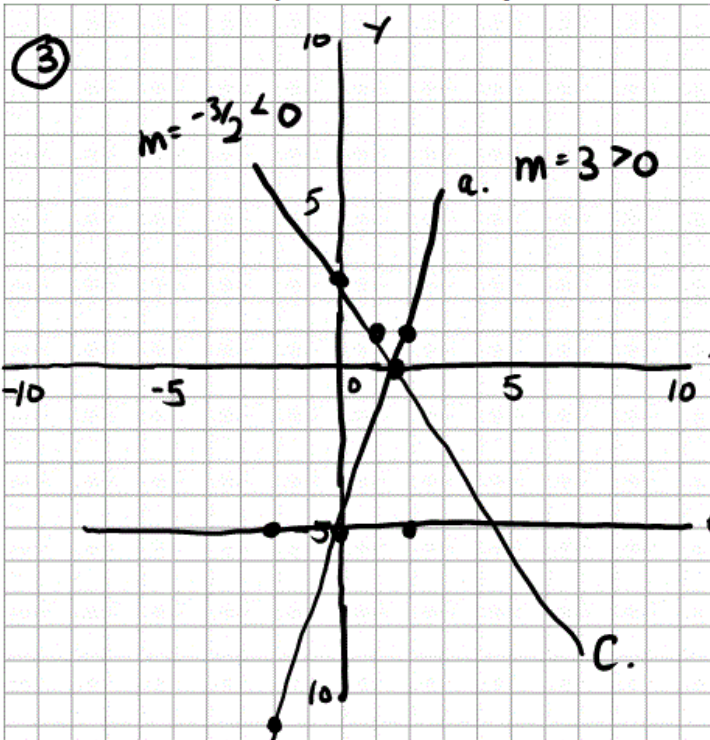
Not a function

e. ✓

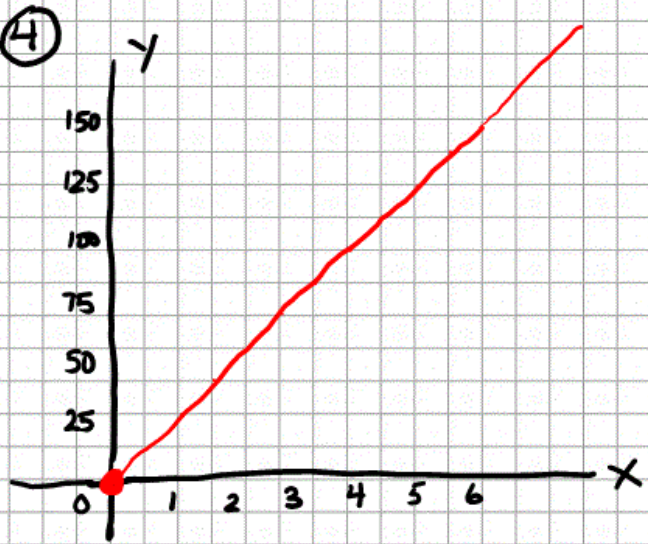
x	0	1	2	3	4
y	-3	-6	-9	-12	-15

slope = -3

Name: _____ Page Number: 5
 Class: Math 1301 Date: 2-12-13
 Topic/Section: _____

Examples and Vocabulary	Notes/Comments/Questions																															
③  a. $f(x) = 3x - 5$ <table border="1"> <thead> <tr> <th>x</th> <th>y</th> <th></th> </tr> </thead> <tbody> <tr> <td>2</td> <td>1</td> <td>→ (2, 1)</td> </tr> <tr> <td>0</td> <td>-5</td> <td>→ (0, -5)</td> </tr> <tr> <td>-2</td> <td>-11</td> <td>→ (-2, -11)</td> </tr> <tr> <td>5/3</td> <td>0</td> <td></td> </tr> </tbody> </table> c. $f(x) = \frac{5-3x}{2} = \frac{5}{2} - \frac{3}{2}x$ <table border="1"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>5/2</td> </tr> <tr> <td>1</td> <td>5/2 - 3/2 = 1</td> </tr> <tr> <td>5/3</td> <td>0</td> </tr> </tbody> </table> e. $f(x) = -5$ <table border="1"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>-5</td> </tr> <tr> <td>2</td> <td>-5</td> </tr> <tr> <td>-2</td> <td>-5</td> </tr> </tbody> </table>	x	y		2	1	→ (2, 1)	0	-5	→ (0, -5)	-2	-11	→ (-2, -11)	5/3	0		x	y	0	5/2	1	5/2 - 3/2 = 1	5/3	0	x	y	0	-5	2	-5	-2	-5	$m = \text{slope}$ $0 = 3x - 5$ $+5 \quad +5$ $5 = 3x$ $5/3 = x$ $0 = \frac{5}{2} - \frac{3}{2}x$ $(-\frac{2}{3})(\frac{5}{2}) = -\frac{3}{2}x(-\frac{2}{3})$ $5/3 = x$
x	y																															
2	1	→ (2, 1)																														
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0	-5																															
2	-5																															
-2	-5																															

Name: _____ Page Number: 6
 Class: Math 1301 Date: 2-12-13
 Topic/Section: _____

Examples and Vocabulary	Notes/Comments/Questions
④  $x =$ tons of landscape rock $y =$ price in dollars a. Find the slope, i.e. $m = 25$ the change in the output when the input increases by 1 unit.	

Name: _____ Page Number: 7
 Class: Math 1301 Date: 2-12-13
 Topic/Section: _____

Examples and Vocabulary	Notes/Comments/Questions
b. Interpret the meaning of the slope in a practical context. The landscape rock costs \$25 per ton.	
c. Find the y-intercept, i.e. the output that matches the input 0. $b = 0 = y\text{-int.}$	
d. Interpret the meaning of the y-int. in a practical context. If you don't purchase any landscape rock, the price is \$0.	

Name: _____ Page Number: 8
 Class: Math 1301 Date: 2-12-13
 Topic/Section: _____

Examples and Vocabulary	Notes/Comments/Questions
e. Write the formula for this function. $y = mx + b = 25x + 0 = 25x$ $m = \text{slope} = \frac{\text{change in } y}{\text{change in } x}$ $= \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$ (x_1, y_1) and (x_2, y_2) are points on the line	