How can you tell from a table, a graph and an equation if a relation is linear or nonlinear?

Table -

If the x's skip count by a constant, calculate the 1st differences. If 1st diff are constant then linear.

Graph -

If the line is straight then linear.

Equation -

If degree 1 then linear.

Determine whether the following relationships are partial or direct.

a) $y = -8x + 0$

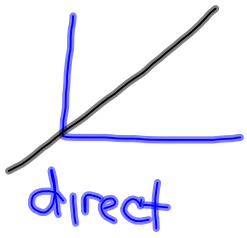
direct

b) $y = 5x + 10$

partial

c)

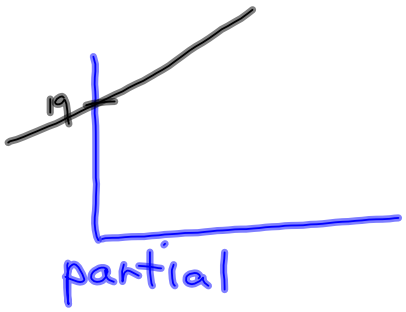
x	y
0	0
1	8
2	16
3	24
4	32
5	40



direct

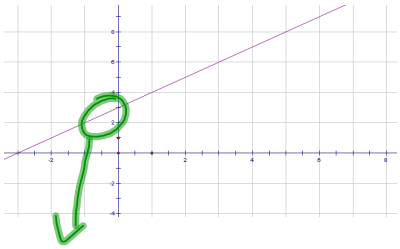
d)

x	y
0	19
1	13
2	7
3	1
4	-5
5	-11



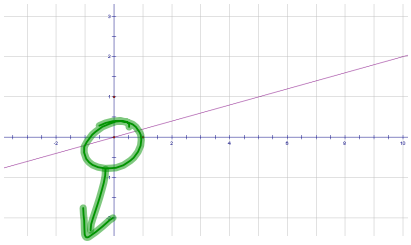
partial

e)



partial

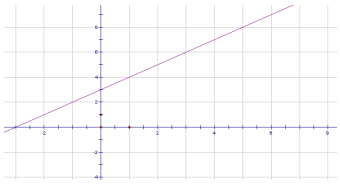
f)



direct

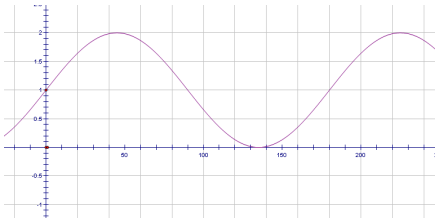
Identify if the following relationships are linear or non-linear and explain how you know.

a)



linear

b)



non-linear

c) $y = 2x^2 - 7$

non-linear b/c degree 2

d) $y = 2x - 7$

linear b/c degree 1

e)

x	y
0	25
1	32
2	35
3	34
4	29
5	20

7, 3, -1, -5, -9

non-linear b/c 1st diff not constant

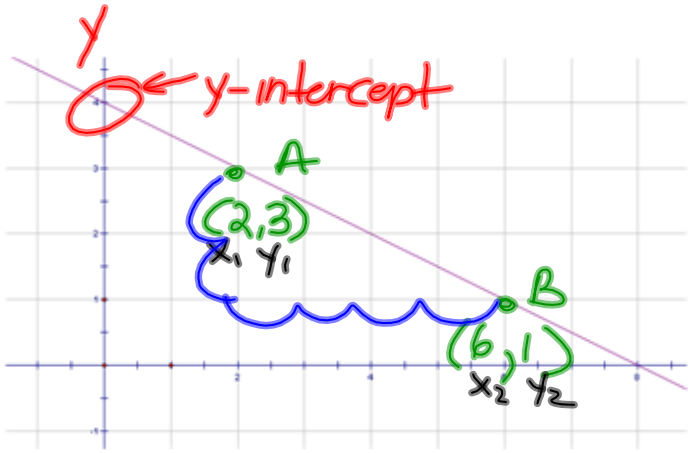
f)

x	y
0	19
1	13
2	7
3	1
4	-5
5	-11

-6, -6, -6, -6, -6

linear

Determine the slope and y-intercept of the following line.



y-intercept = 4

$$m = \frac{\text{rise}}{\text{run}} = \frac{-2}{4} = -\frac{1}{2}$$

Determine the x- and y-intercept of the following line and use this information to graph the line.

a) $2x + 7y = 21$

x

$2x+7(0)=21$

$\frac{2x}{2}=\frac{21}{2}$

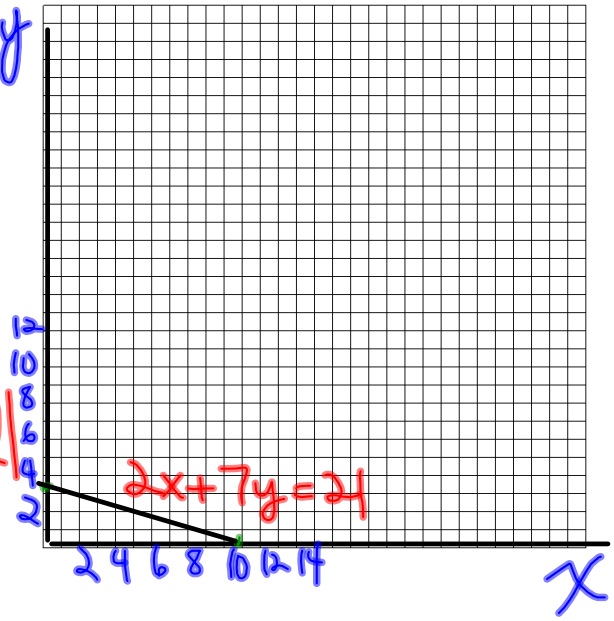
$x=(10.5)$

y

$2(0)+7y=21$

$\frac{7y}{7}=\frac{21}{7}$

$y=(3)$



Maximus Pizza sells their slices of Cheese pizza for $2, plus $0.50 for each additional topping.

a) Write an expression that represents the cost (C) of a slice of pizza in terms of the number of toppings (n).

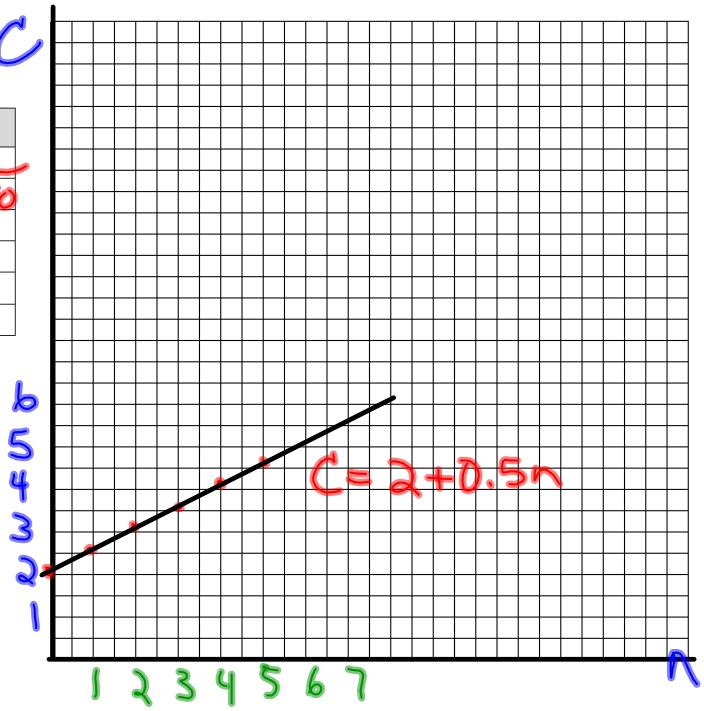
$C = 2 + 0.5n$

C = cost of pizza slice

n = # of toppings

b) Create a table of values which shows the cost of a slice of pizza with 0-5 toppings, then use this to graph the relationship.

n	C
0	2+0.5(0)= 2
1	2+0.5(1)=2.50
2	3.00
3	3.50
4	4.00
5	4.50
x	y



c) Identify the slope and y-intercept from your graph.

Slope = m = 0.5

y-intercept = b = 2

C = 0.5n + 2

y = m x + b

Homework Review Questions

Section 3.1	p. 147 # 5a, 8a, 10, 15 (just equation)
Section 3.2	p. 151 #1, read over p. 161 and p. 183 #2a
Section 3.3	p. 157 #7, 13
Section 3.4	p. 170 #5, 6 and p. 183 #6
Section 3.5	p. 184 #9