Warm-Up

ERROR ANALYSIS In Exercises 19 and 20, describe and correct the error in the statement about the relation shown in the table.

domain
range

Input, x	1	2	3	4	5
Output, y	6	7	8	6	9

function

19. ✗ The relation is *not* a function. One output is paired with two inputs.

The relation is a function.
one input paired w/ one output

20. ✗ The relation is a function. The range is 1, 2, 3, 4, and 5.

domain

3.2 Linear Functions

Line

Linear Equation $y = mx + b$, m & b are constants

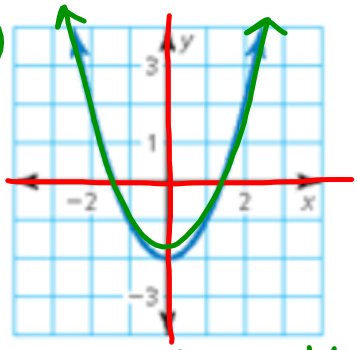
$y = -2x + 5$

Constant rate of change (slope)

Ex 1 Identifying a Linear Function (Graphs)

Does the graph represent a *linear* or *nonlinear* function? Explain.

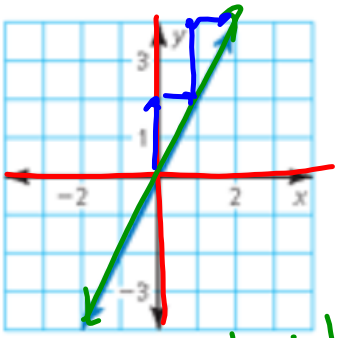
a)



This is not a line

Nonlinear

b.



This is a straight line

linear

Ex 2 Identifying Linear Functions (Tables)

Does the table represent a *linear* or *nonlinear* function? Explain.

a.

x	3	6	9	12
y	36	30	24	18

+3 +3 +3 ; -6 -6 -6

as x increases by 3
y decreases by 6
Its Constant → LINEAR

b.

x	1	3	5	7
y	2	9	20	35

+2 +2 +2 ; +7 +11 +15

as x increases by 2
y increases by DIFFERENT amounts
not constant → NONLINEAR

Ex 3 Identifying Linear Equations (Equations)

Which of the following equations represent linear functions? Explain

y = mx + b

a) $y = 3.8$
No b/c x is missing

b) $y = \sqrt{x}$
No b/c √

c) $y = 3^x$
No b/c x → exponent

d) $y = \frac{2}{x}$
No b/c x → denominator (numerator ok!)

e) $y = 6(x - 1)$
y = 6x − 6
Yes b/c y = mx + b

f) $x^2 - y = 0$
no b/c x^2 can't have an exponent