

BE-1A

WEDNESDAY 1-16-08

① Solve for y

$$-2x + 3y = x + 15$$

② If the domain of the equation in ① is $\{-2, -1, 0, 1, 2\}$, find the range.

③ Graph the equation in ①.

TAKE OUT homework Pg. 215 #20-25

LINEAR in a line

LINEAR Equation

AN Equation that
when graphed, is a
line.

1.
Is there any way to tell in advance if an equation is a linear equation?

Test: if the only terms are x , y and numbers separated by $+$ or $-$, the equation is linear

Ⓔ $3x + 2y = 7$

Ⓔ $5x - 2x + 3y + y = x + y + 1$

Ⓔ $7x + y - 2x + 3y = 14$

Ⓔ NOT LINEAR:

$$4xy = 1$$

$$2x^2 = 2$$

$$\frac{5}{x} = 6$$

$$3x + y^3 = 6$$

THERE ARE 2 COMMON WAYS TO
collect terms AND SHOW linear
Equations:

EX) * "Solve for y" form

$$y = 2x + 5$$

$\uparrow$ $\uparrow$ $\uparrow$
 y by All x All numbers
 itself terms combined
 combined

* for
T-TABLES
AND
GRAPHS

EX) "Standard" form

$$2x + 3y = 12$$

$\underbrace{\hspace{2cm}}$ $\uparrow$
 All x and y All numbers
 terms combined and combined and
 on left side on right side

$$\boxed{Ax + By = C}$$

* You can go from any form to another
as long as you do your "undos" correctly
AND FOLLOW THE GRE.

Some extra things to know about the standard form $Ax + By = C$

- A should be positive
- A, B, C should be integers

Ex) $\frac{1}{3}x + y = 4$ multiply by 3

$$3 \left(\frac{1}{3}x + y \right) = 4 \cdot 3$$

$$\boxed{x + 3y = 12} \quad \text{STANDARD FORM}$$

$$\begin{array}{ccc} \uparrow & \uparrow & \uparrow \\ A=1 & B=3 & C=12 \end{array}$$

$$Ax + By = C$$

Convert to "Solve for y " form

$$\begin{array}{rcl} x + 3y & = & 12 \\ -x & & -x \end{array}$$

$$\frac{3y}{3} = \frac{-x + 12}{3}$$

$$\boxed{y = -\frac{1}{3}x + 4} \quad \checkmark$$

EX1
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CH 4-5 GRAPHING LINEAR EQUATIONS

DETERMINE IF EACH EQUATION IS A
LINEAR EQUATION, if it is, put it in
STANDARD FORM

① $y = 5 - 2x$
 $+2x \qquad +2x$

$$\boxed{2x + y = 5}$$

A, B, C?

② $2xy - 5y = 6$

③ $3x + 9y = 15$

↑ ↑ ↑

HAVE COMMON FACTOR OF 3, $\div$ both sides by 3

$$\boxed{x + 3y = 5}$$

④ $\frac{1}{3}y = -1$

$$3 \cdot \frac{1}{3}y = -1 \cdot 3$$

$$\boxed{y = -3}$$

$$0x + 1y = -3$$

A, B, C?

EX 2
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GRAPH $x + 2y = 6$

Step 1: SOLVE FOR y

$$\begin{array}{r} x + 2y = 6 \\ -x \quad \quad -x \end{array}$$

$$\frac{2y}{2} = \frac{-x + 6}{2}$$

Step 2 T-TABLE $y = -\frac{1}{2}x + 3$

* NO
domain
was
given,
Assume

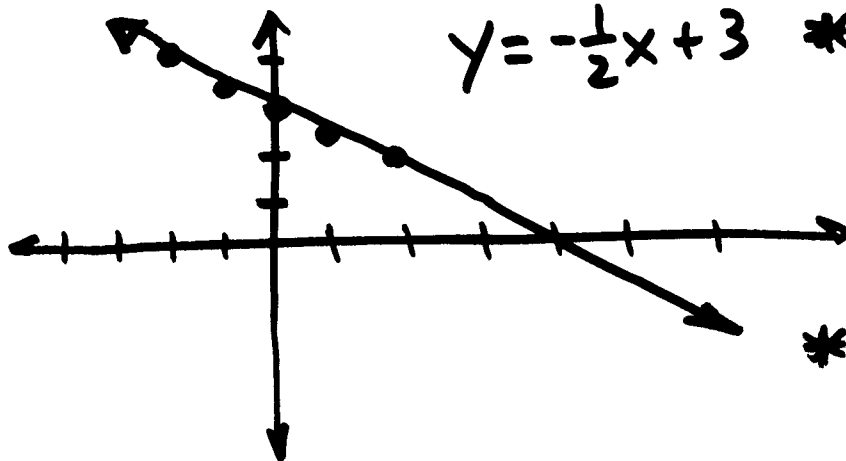
All
Real
Numbers,
you pick

$x = -2$

-1
 0
 1
 2

x	$-\frac{1}{2}x + 3 = y$
-2	$-\frac{1}{2}(-2) + 3 = 4$
-1	$-\frac{1}{2}(-1) + 3 = 3\frac{1}{2}$
0	$-\frac{1}{2}(0) + 3 = 3$
1	$-\frac{1}{2}(1) + 3 = 2\frac{1}{2}$
2	$-\frac{1}{2}(2) + 3 = 2$

$$y = -\frac{1}{2}x + 3 \quad *$$



* Draw line
with arrows,
label line.

Homework:

- Page 221 # 1, 4, 6, 10, 12
 - Read chapter 4-5.
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