Algebra 1 3.1

Identify linear equations, intercepts, and zeros

Graph linear equations

integer

linear equation

standard form $Ax + By = C$

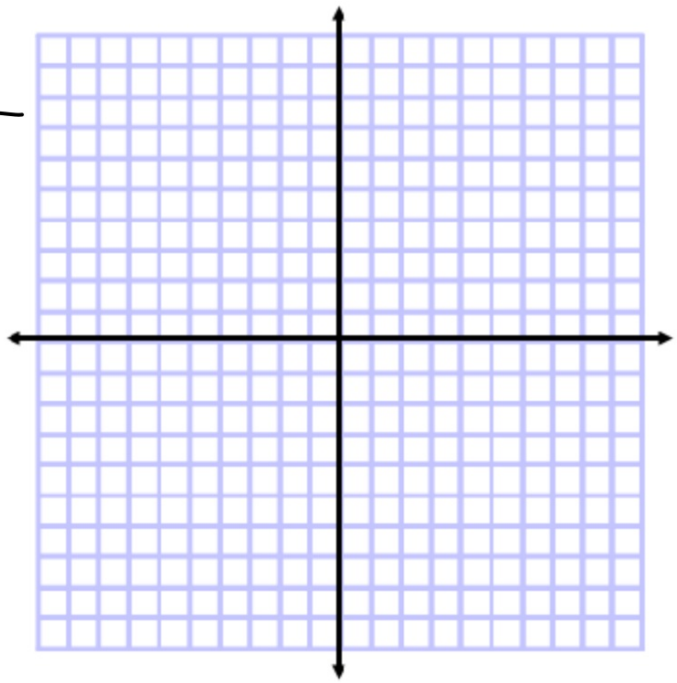
constant

variable

x-intercept

y-intercept

whiteboards



$(-3,0)$ $(0,\frac{3}{2})$

Graph each equation by using the *x*- and *y*-intercepts.

4A. $-x + 2y = 3$ **4B.** $y = -x - 5$

whiteboards

$-x + 0 = 3$

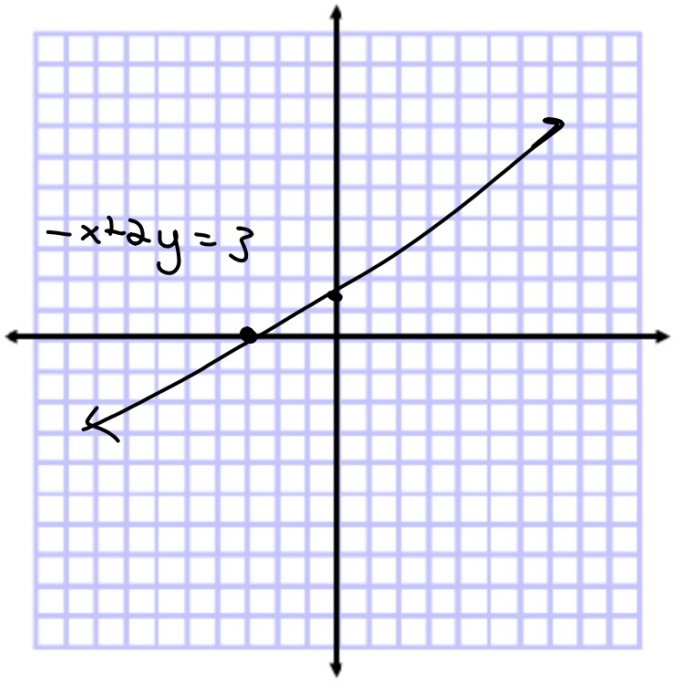
$\frac{-x}{-1} = \frac{3}{-1}$

$x = -3$

$-0 + 2y = 3$

$\frac{2y}{2} = \frac{3}{2}$

$y = \frac{3}{2}$



KeyConcept Standard Form of a Linear Equation

Words	The standard form of a linear equation is $Ax + By = C$, where $A \geq 0$, A and B are not both zero, and A, B, and C are integers with a greatest common factor of 1.
Examples	In $3x + 2y = 5$, $A = 3$, $B = 2$, and $C = 5$. In $x = -7$, $A = 1$, $B = 0$, and $C = -7$.

$(A)x + (B)y = (C)$

$3x + 2y = 5$

- In order
- Integers
- no GCF
- A is positive

$5x - 8y = 17$

$3x + 6 = 2y$

SF

$3x + 6 = 2y$

$+6 \quad +6$

$-6 \quad -6$

$3x = 2y - 6$

$-2y \quad -2y$

$3x - 2y = -6$

$A = 3 \quad B = -2$

$C = -6$

$y = 5x + 7 \quad A = 5$

$+5x \quad +5x \quad B = 1$

$5x + y = 7 \quad C = 7$

$-2x - 8y = 12$

$\frac{-2x}{2} \quad \frac{-8y}{2} \quad \frac{12}{2} \longrightarrow \frac{-1x}{-1} - \frac{4y}{-1} = \frac{6}{-1} \longrightarrow 1x + 4y = -6$

$A = 1 \quad B = 4 \quad C = -6$

$\left(\frac{1}{2}\right)x + \left(\frac{1}{3}\right)y = 5$

$6 \cdot \frac{1}{2}x + 6 \cdot \frac{1}{3}y = 6 \cdot 5$

$3x + 2y = 30$

A b/c

DD

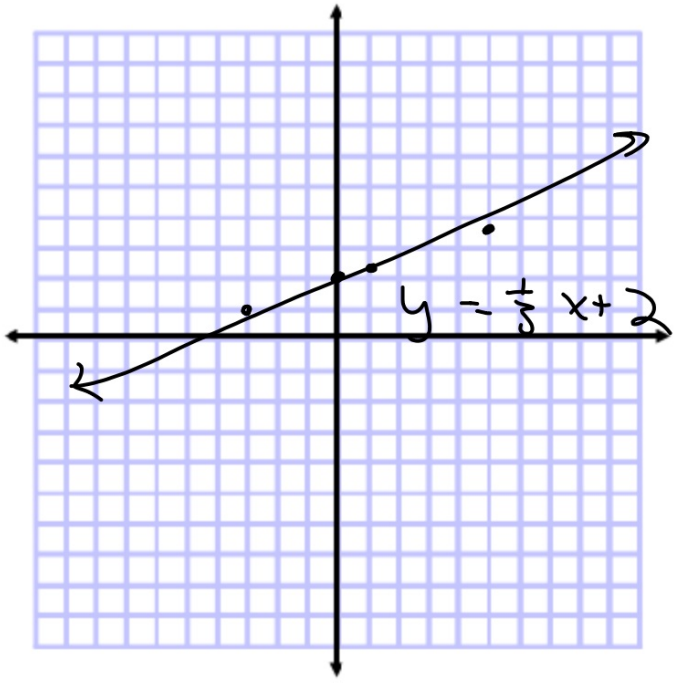
Example 5 Graph by Making a Table

Graph $y = \frac{1}{3}x + 2$.

x	$y = \frac{1}{3}x + 2$	y
1	$\frac{1}{3} \cdot 1 + 2$	$2\frac{1}{3}$
-3	$\frac{1}{3} \cdot -3 + 2$	1
0	$\frac{1}{3} \cdot 0 + 2$	2
5	$\frac{1}{3} \cdot 5 + 2$	$3\frac{2}{3}$

2/5

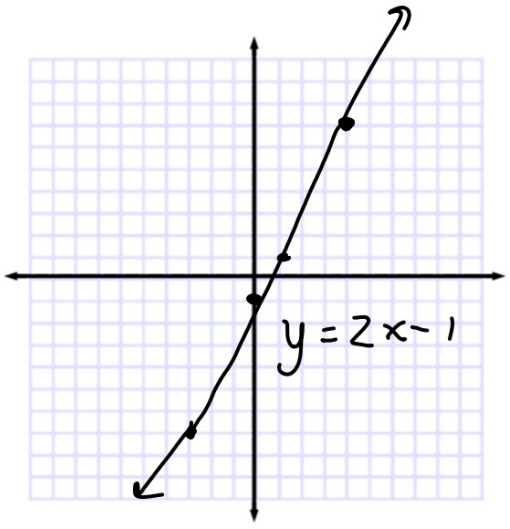
Table of values (TOV)
Choose 4 values for x:
1 pos, 1 neg, zero, cook's choice



$y = 2x - 1$

x	$2x-1$	y
4	$2 \cdot 4 - 1$	7
-3	$2 \cdot -3 - 1$	-7
0	$2 \cdot 0 - 1$	-1
1	$2 \cdot 1 - 1$	1

T.O.V.



TOV: Solve for y first, OR use x&y intercepts
(Which would be easier?

GuidedPractice

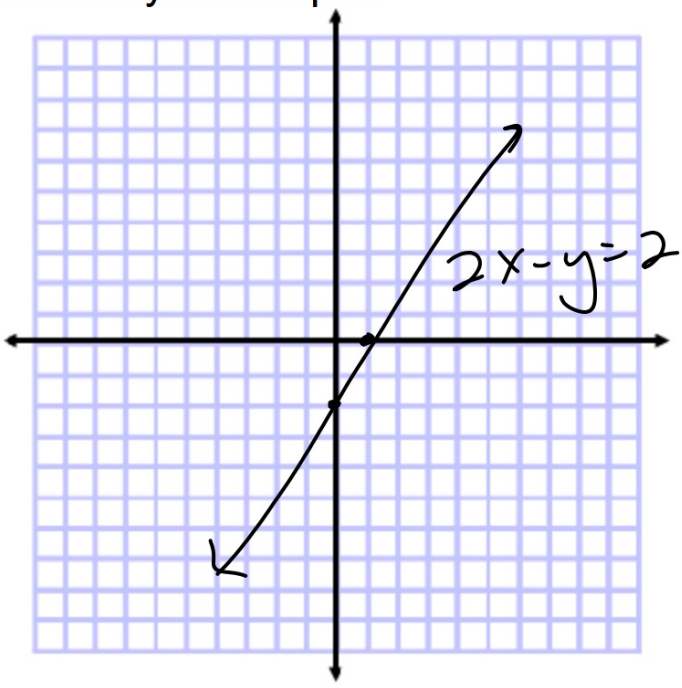
Graph each equation

5A. $2x - y = 2$

$(1, 0)$ $2x - 0 = 2$

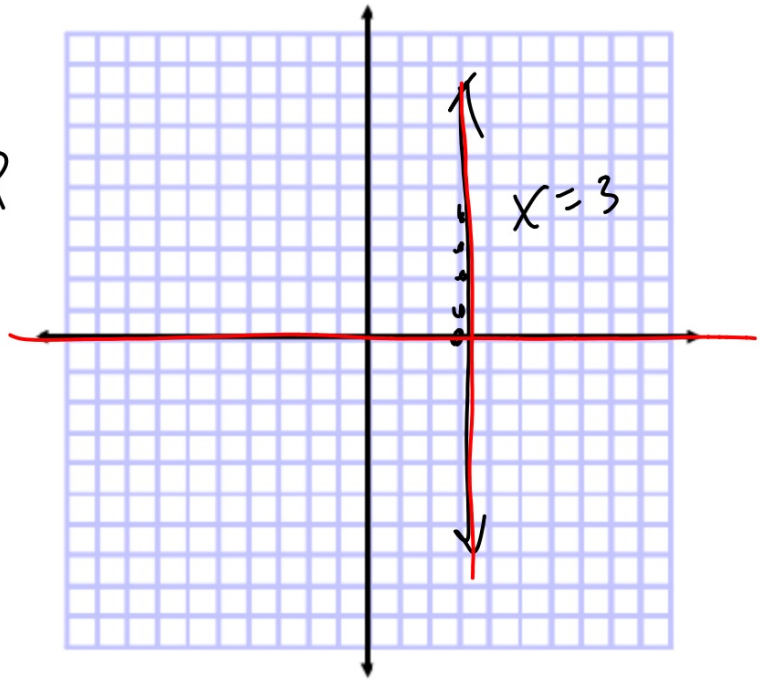
$\frac{2x}{2} = \frac{2}{2}$

$(0, -2)$



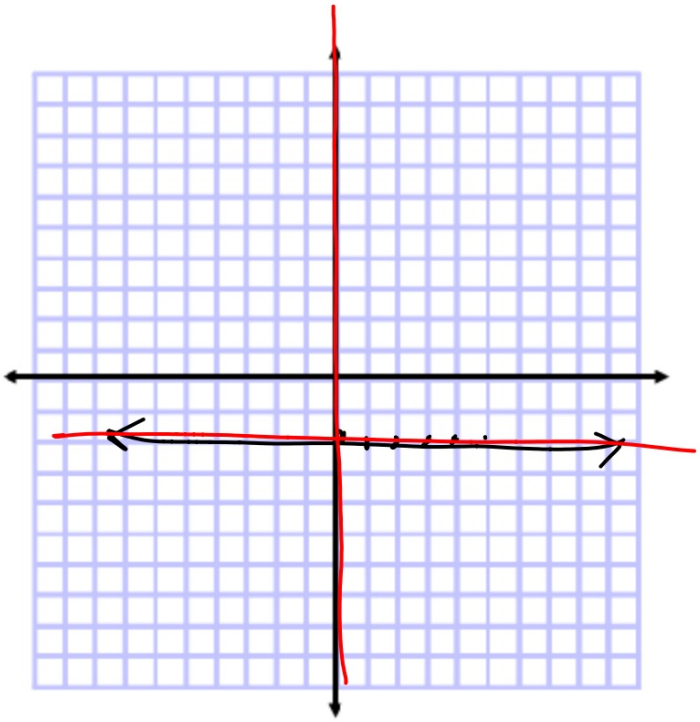
Special cases:

56. $x = 3$ vertical



5C. $y = -2$ horizontal

-2
-2
-2
-2



$$Ax + By = C$$