Algebra 1 3.1

Identify linear equations, intercepts, and zeros

Graph linear equations

integer

linear equation

~~standard form~~

constant 5

variable x, t

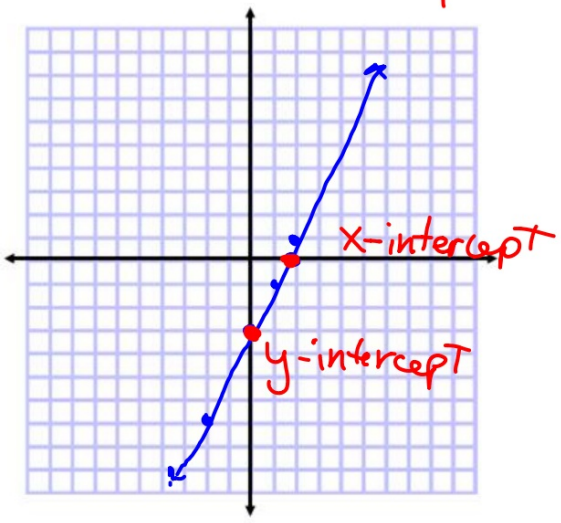
x-intercept

y-intercept

coefficient

whiteboards

		$2x-3$	
pos.	2	$2\cdot 2-3$	1
0	0	$2\cdot 0-3$	-3
neg.	-2	$2\cdot -2-3$	-7
choice	1	$2\cdot 1-3$	-1



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 $C = -7$.

Skip (for now)

$\frac{1}{2}x$ $\frac{1}{2x}$

Example 1 Identify Linear Equations

Determine whether each equation is a linear equation. ~~Write the equation in standard form.~~

a. $y = 4 - 3x$

linear

x
y
constants

$\frac{3}{x}$

b. $6x - xy = 4$

Not linear
nonlinear

$\neq$

no expon.
no x·y.
no var. in denom

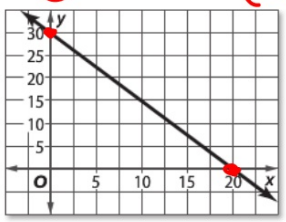
Standardized Test Example 2 Find Intercepts

Find the x- and y-intercepts of the line graphed at the right.

x y

x-int = (20, 0)

y-int = (0, 30)



$2x - 5 = y$

$x^2 + 3x - 7 = 5$

$3x - 2xy + 5 = a$

$4 + \frac{1}{2}x = y$

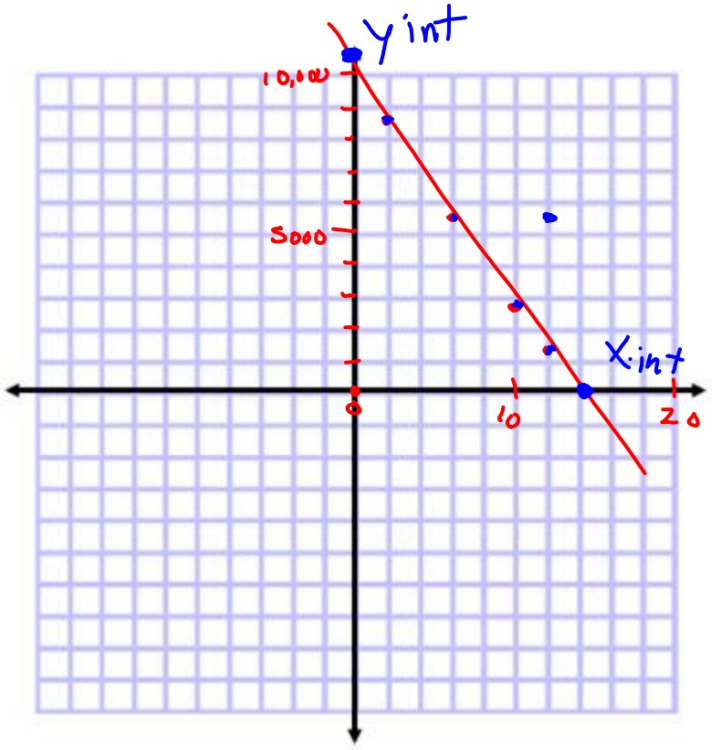
$4x + \frac{y}{3} = 7$

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

2. **HEALTH** Find the x- and y-intercepts of the graph.

x-int ( ) none

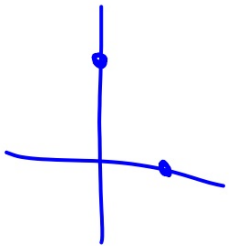
y-int (0, 150)

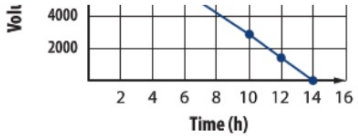


Draining a Pool	
Time (h)	Volume (gal)
x	y
0	10,080
2	8640
6	5760
10	2880
12	1440
14	0

y-int (0, 10,080)

x-int (14, 0)

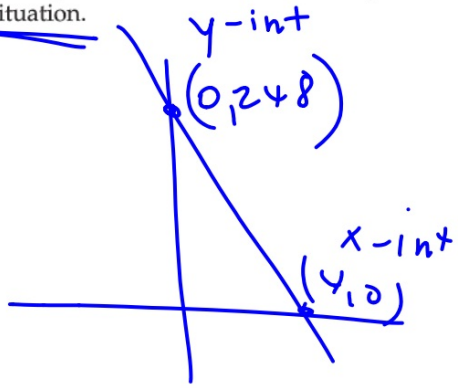




Guided Practice

3. DRIVING The table shows the function relating the distance to an amusement park in miles and the time in hours the Torres family has driven. Find the x- and y-intercepts. Describe what the intercepts mean in this situation.

Time (h)	Distance (mi)
0	248
1	186
2	124
3	62
4	0

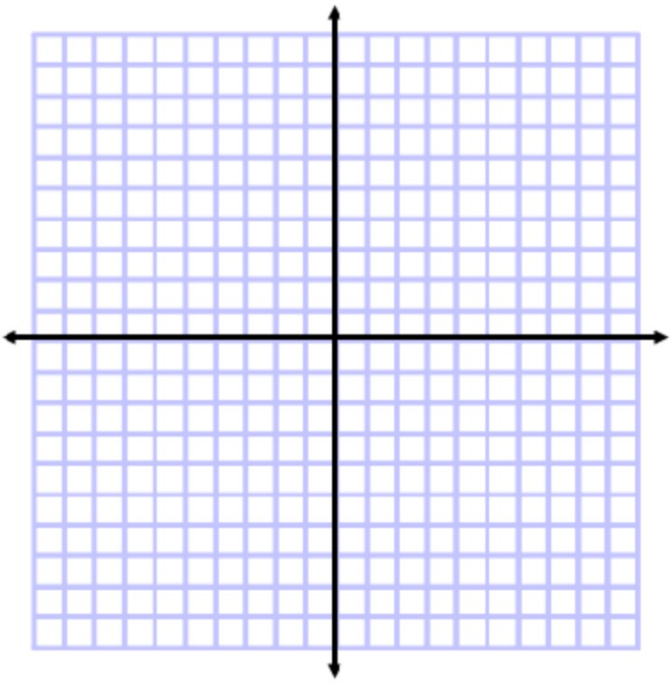


When @ x-intercept, what is the y-coordinate?
When @ y-intercept, what is the x-coordinate?

How can I use what I know about intercepts?

Example 4 Graph by Using Intercepts

Graph $2x + 4y = 16$ by using the x- and y-intercepts.



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

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

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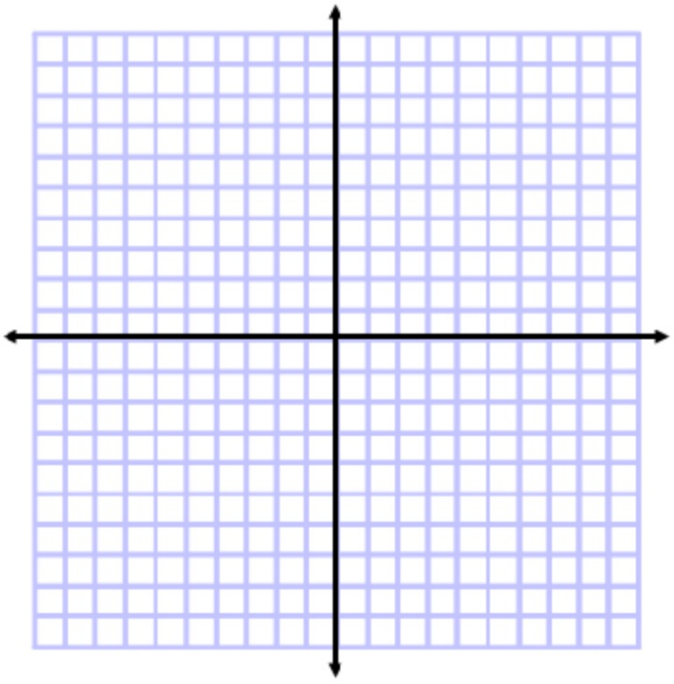
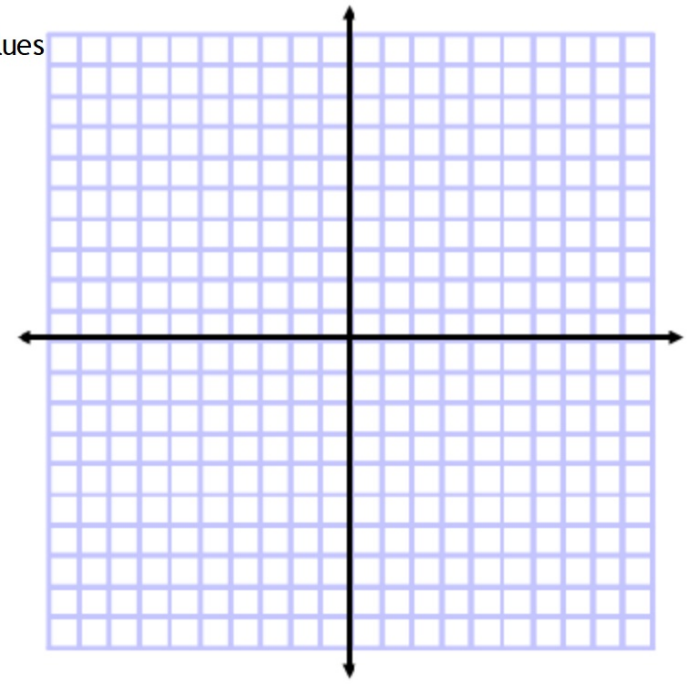


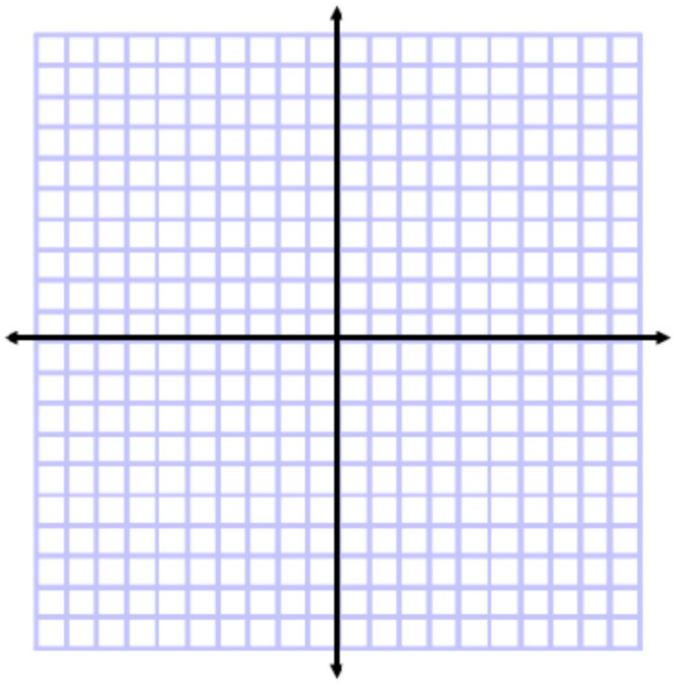
Graph by making a table of values

$y = 2x + 1$



Example 5 Graph by Making a Table

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

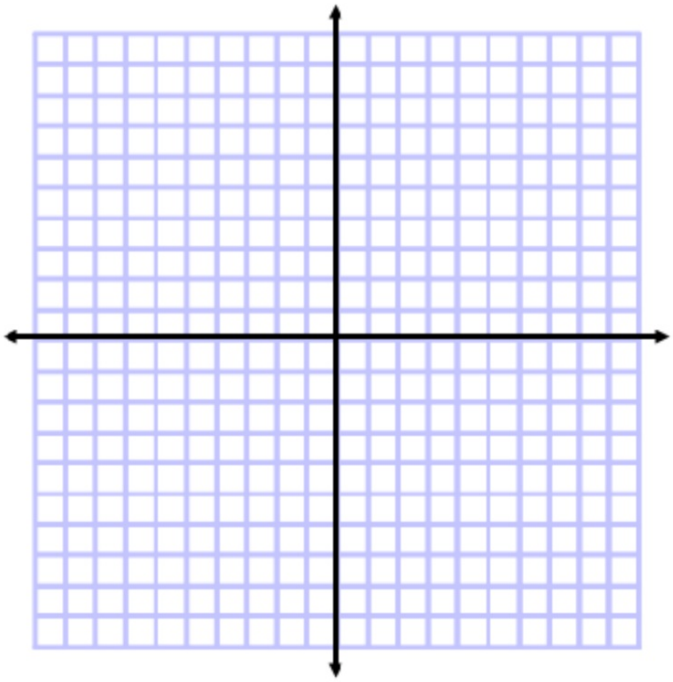


Solve for y

GuidedPractice

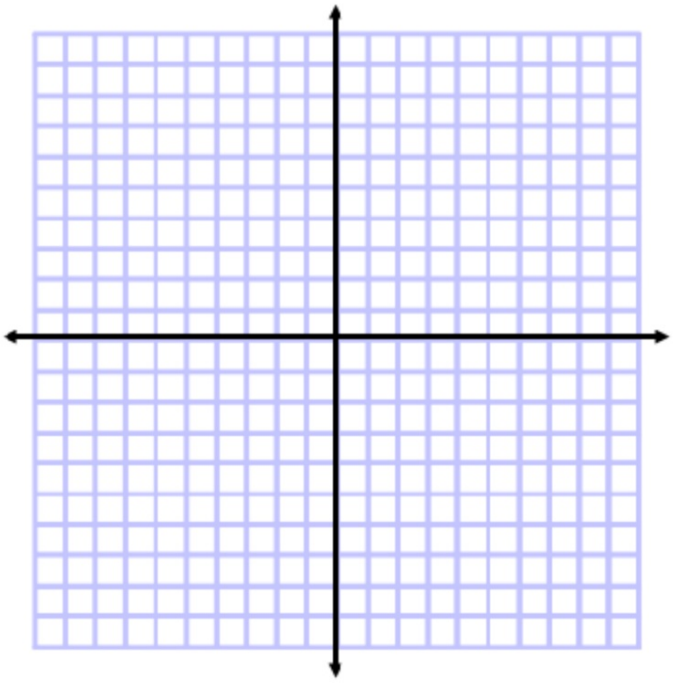
Graph each equation

5A. $2x - y = 2$



You can only choose 3 for x

5B. $x = 3$



You will get -2 for y, no matter what.

5C. $y = -2$