Algebra 1 4.1 $y = mx + B$

Write and graph linear equations in slope-intercept form.

Model data with equations in slope-intercept form

linear

slope

y-intercept

y=mx+b

constant function (horizontal)

bicycles and constant slope

Youtube:ymca

Song

Whiteboards

**Write an equation of a line in slope-intercept form with the given slope and $y$-intercept. Then graph the equation.**

**1** slope: 2, $y$-intercept: 4

**2.** slope: $-5$, $y$-intercept: 3

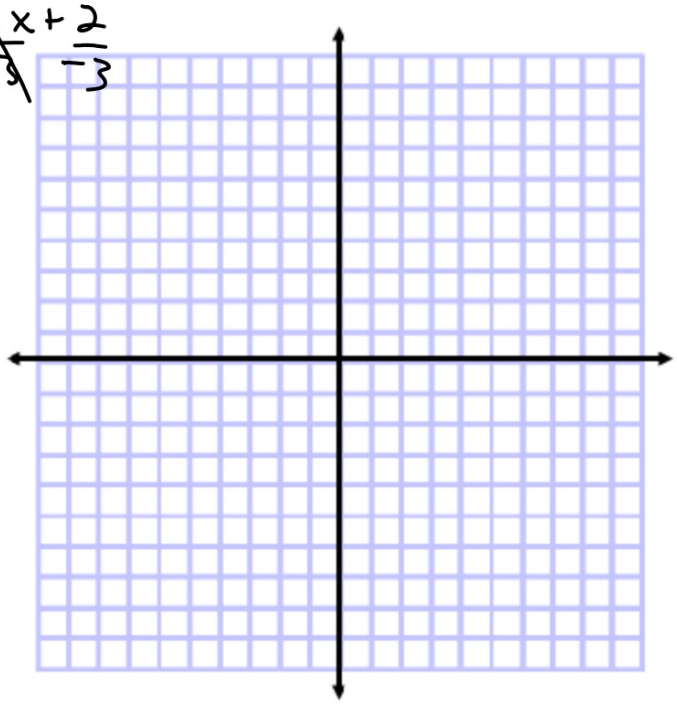
**5.** $-4x + y = 2$

+4x −4x

$-3y = 4x + 2$

$\frac{-3y}{-3} = \frac{4x}{-3} + \frac{2}{-3}$

$y = -\frac{4}{3}x - \frac{2}{3}$



**6.** $2x + y = -6$

$y = mx + B$

**GuidedPractice**

**Graph each equation.**

**3A.** $y = 5$ $m = \frac{0}{1}$

x = 2

y = -4 $m = \frac{0}{1}$

x = -1

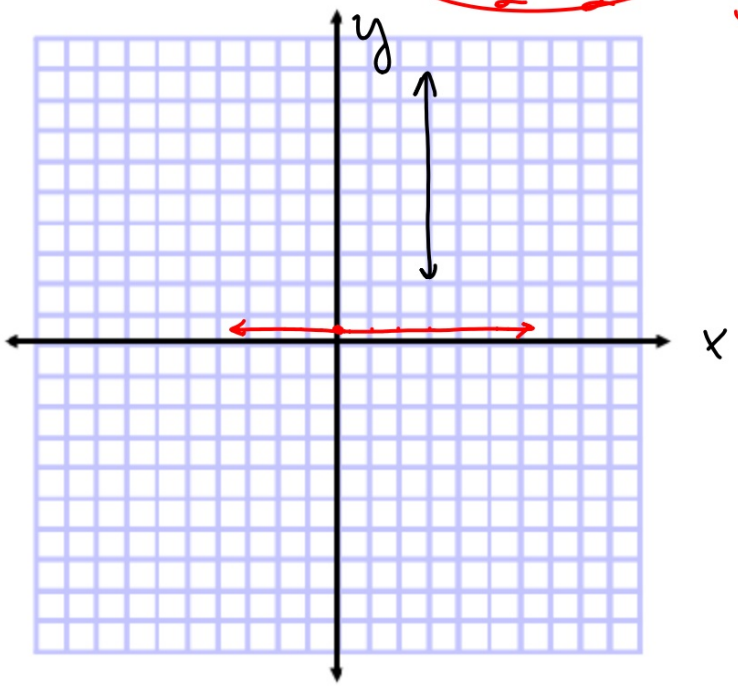
$y = mx + B$

*Special cases:*
*horizontal & vertical*

↓ y = constant
horizontal

↓ x = constant
vertical

**3B.** $\frac{2y}{2} = \frac{1}{2}$ $y = \frac{1}{2}$



Where do they start (B)? What is the rate of change (m)?

## Real-World Example 5 Write and Graph a Linear Equation

**SPORTS** Use the information at the left about high school sports.

**a.** Write a linear equation to find the number of girls in high school sports after 1997.

$y = mx + B$

$m$: rate of change

$B$: start

**Real-World Link**

In 1997, about 2.6 million girls competed in high school sports. The number of girls competing in high school sports has increased by an average of 0.06 million per year since 1997.

**Source:** National Federation of High School Associations

B: 2,600,000

m: 60,000

**b.** Graph the equation.

$y = 0.06x + 2.6$

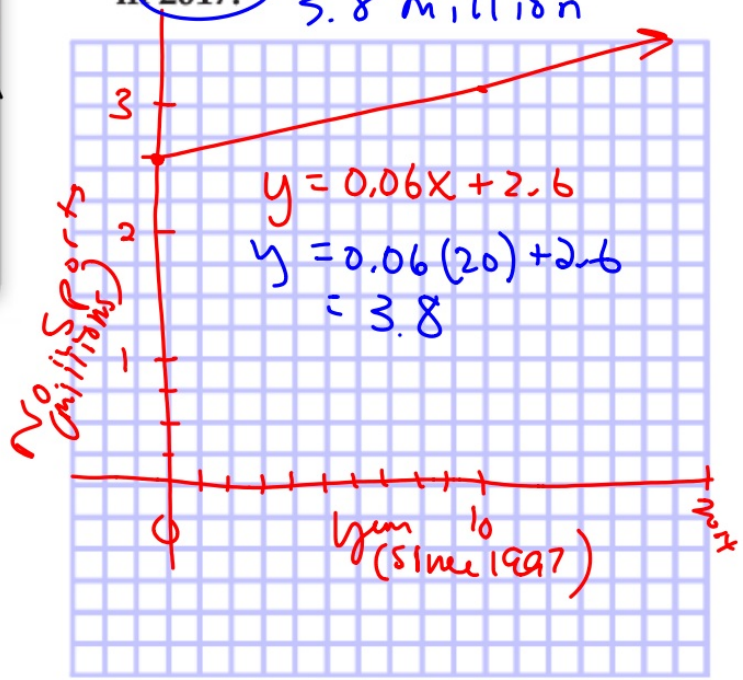
**c.** Estimate the number of girls competing in 2017.

3.8 million

$y = 0.06x + 2.6$

$y = 0.06(20) + 2.6$

$= 3.8$




$\frac{0.06}{1} \quad \frac{0.6}{10} \quad \frac{6}{100}$

**GuidedPractice** $y = 5x + -1160$

$m =$

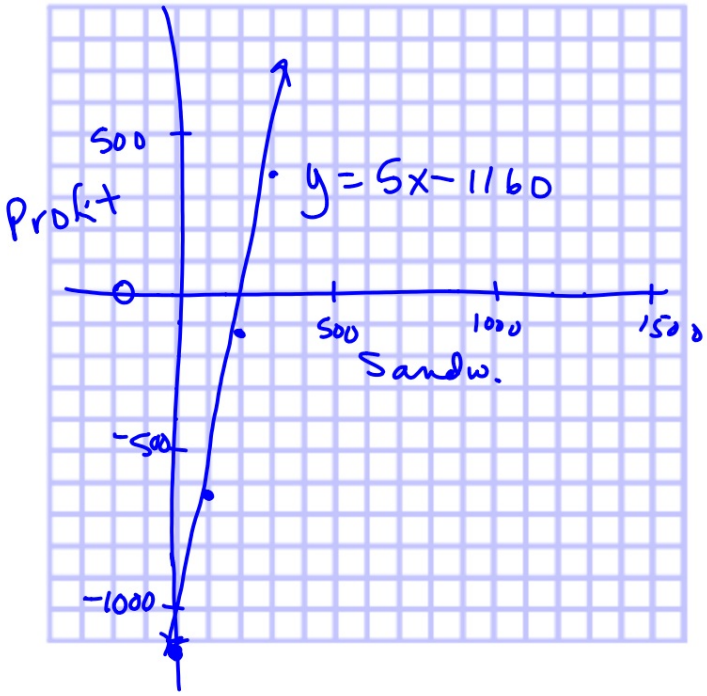
**5. FUNDRAISERS** The band boosters are selling sandwiches for $5 each. They bought $1160 in ingredients.

**A.** Write an equation for the profit $P$ made on $n$ sandwiches.

**B.** Graph the equation. $P = 5n + -1160$

**C.** Find the total profit if 1400 sandwiches are sold.

When do they make a profit?




$y = 5 \cdot 1400 - 1160$

$= 5840$

$\frac{5}{1} \quad \frac{50}{10} \quad \frac{500}{100}$