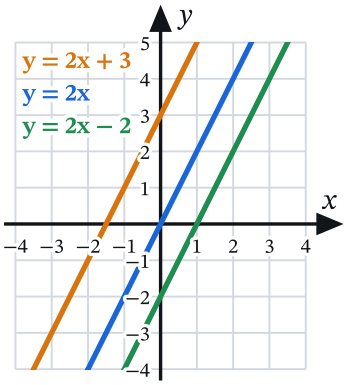
Names (pair) _____ Date _____

Parallel Lines

Example



All three lines have $m = 2$: they are equally steep, so they are **parallel**. Only the y-intercept b is different: the line is shifted up or down.

Remember

The lines $y = m_1x + b_1$ and $y = m_2x + b_2$ are **parallel** if $m_1 = m_2$ and $b_1 \neq b_2$. If both m and b are equal, it is the same line. Lines with the same b pass through the same point $(0, b)$.

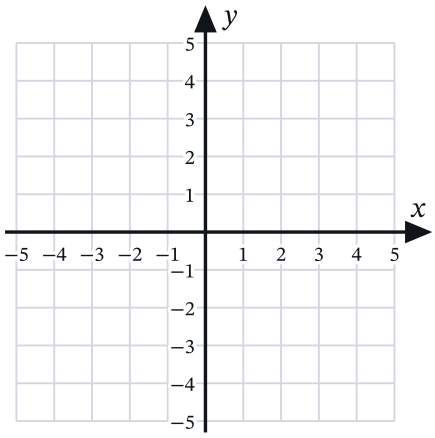
1 IN PAIRS Find the pairs of parallel lines and one pair that is the same line. Write the letters.

A $y = 3x - 1$ **B** $y = -\frac{1}{2}x + 2$ **C** $y = 2x + 1$ **D** $y = 3x + 4$

E $y = 1 + 2x$ **F** $y = -\frac{1}{2}x - 3$ **G** $y = -3x + 4$ **H** $y = 2x - 5$

parallel: ☐ ☐ ☐ the same line: ☐

2 ON YOUR OWN Draw the lines $y = mx + 1$ for $m = 2$, $m = 0$ and $m = -1$. What do they have in common?



Names (pair) _____ Date _____

3 ON YOUR OWN Write the equation of the line parallel to $y = 3x - 2$ through the given point.

$(0, 5)$ $y =$ ☐

$(1, 4)$ $y =$ ☐

$(2, -1)$ $y =$ ☐

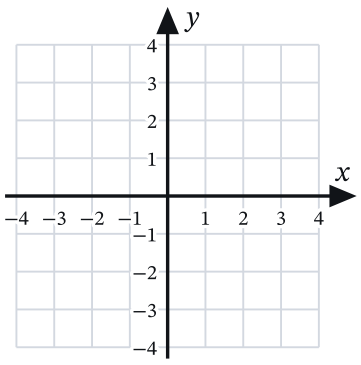
4 ON YOUR OWN Are the lines parallel? First write the second line in the form $y = mx + b$.

$y = 2x + 3$ and $4x - 2y = 6$ ☐ **yes** / **no**

$y = -x + 1$ and $x + y = 5$ ☐ **yes** / **no**

$y = \frac{1}{2}x$ and $y = 2x$ ☐ **yes** / **no**

5 ON YOUR OWN CHALLENGE Draw $y = 2x$ and $y = -\frac{1}{2}x$. What angle do they make? Work out the product of the slopes.



angle: ☐

$m_1 \times m_2 =$ ☐

The Line Explorer app · otooly.com/line-explorer

Type a line, press Keep line, then change only b. Then keep a line and change only m.

The Geoboard app · otooly.com/geoboard

Functions board: stretch two parallel bands. Compare their slopes.

★ ON YOUR OWN **Exit card.** The line parallel to $y = -4x + 1$ through $(0, -2)$: $y =$ ☐