Algebra II

Name_____ key

Change the linear equations below to slope intercept form.
Solve for y.

Problem	Work	Answer
1. $4x - 3y = 9$	$-3y = -4x + 9$ $\dfrac{y}{-3} = \dfrac{-4}{-3}x + \dfrac{9}{-3}$	1. y = $\frac{4}{3}x - 3$
2. $6x + 8y = 16$	$\dfrac{8y}{8} = \dfrac{-6x}{8} + \dfrac{16}{8}$	2. y = $-\frac{3}{4}x + 2$
3. $-3x + 9y = 4$	$\dfrac{9y}{9} = \dfrac{3x}{9} + \dfrac{4}{9}$	3. y = $\frac{1}{3}x + \frac{4}{9}$
4. $-8x - 7y = -14$	$\dfrac{-7y}{-7} = \dfrac{8x}{-7} - \dfrac{14}{-7}$	4. y = $-\frac{8}{7}x + 2$
5. $9y - 3x = -27$	$\dfrac{9y}{9} = \dfrac{3x}{9} - \dfrac{27}{9}$	5. y = $\frac{1}{3}x - 3$
6. $-3y - 6x = -12$	$\dfrac{-3y}{-3} = \dfrac{6x}{-3} - \dfrac{12}{-3}$	6. y = $-2x + 4$
7. $3x - 2y - 10 = -2$ $\quad +10 \; +10$	$3x - 2y = 8$ $\dfrac{-2y}{-2} = \dfrac{-3x}{-2} + \dfrac{8}{-2}$	7. y = $\frac{3}{2}x - 4$
8. $\frac{4}{3}x + 6y = \frac{3}{2}$	$\frac{1}{6} \cdot 6y = \frac{1}{6} \cdot -\frac{4}{3}x + \frac{3}{2} \cdot \frac{1}{6}$ $y = -\frac{4}{18}x + \frac{3}{12}$	8. y = $-\frac{2}{9}x + \frac{1}{4}$
9. $-\frac{1}{3}x - \frac{2}{5}y = -\frac{7}{5}$	$\frac{5}{-2} \cdot -\frac{2}{5}y = \frac{5}{-2} \cdot \frac{1}{3}x - \frac{7}{5} \cdot \frac{5}{-2}$ $y = \frac{5}{-6}x - \frac{35}{-10}$	9. y = $-\frac{5}{6}x + \frac{7}{2}$
10. $\frac{2}{3}x - \frac{3}{4}y - \frac{3}{8} = 4$ $\quad +\frac{3}{8} \; +\frac{3}{8}$	$\frac{2}{3}x - \frac{3}{4}y = \frac{35}{8}$ $\frac{4}{-3} \cdot -\frac{3}{4}y = \frac{4}{-3} \cdot -\frac{2}{3}x + \frac{35 \cdot 4}{8 \cdot -3}$	10. y = $\frac{8}{9}x - \frac{35}{6}$

$$y = -\frac{8}{9}x + \frac{140}{-24}$$

Mixed Review on Linear Equations

1) What is the equation of a line with a slope of 3 that goes through the point (2,8)?

$$y - 8 = 3(x - 2)$$

$$y - 8 = 3x - 6$$
$$y = 3x + 2$$

2) What is the equation of a line through the point (1,3) that has a slope of -2?

$$y - 3 = -2(x - 1)$$

$$y - 3 = -2x + 2$$
$$y = -2x + 1$$

3) What is the equation of a line through the point (-2, 3) that has a slope of 4?

$$y - 3 = 4(x - -2)$$
$$y - 3 = 4(x + 2)$$

$$y - 3 = 4x + 8$$
$$y = 4x + 11$$

4) What is the equation of a line through the point (1,3) that has a slope of -2?

$$y - 3 = -2(x - 1)$$

$$y - 3 = -2x + 2$$
$$y = -2x + 5$$

5) What is an equation for the line that passes through the coordinates (4,5) and (8, 3)?

$$\frac{5-3}{4-8} = \frac{2}{-4} = -\frac{1}{2}$$

$$y - 5 = -\frac{1}{2}(x-4) \quad \text{or} \quad y - 3 = -\frac{1}{2} \times (x-8)$$

6) What is an equation for the line that passes through the coordinates (-1,2) and (7,6) ?

$$\frac{2-6}{-1-7} = \frac{-4}{-8} = \frac{1}{2}$$

$$y - 2 = \frac{1}{2}(x+1) \quad \text{or} \quad y - 6 = \frac{1}{2}(x-7)$$

7) Find the equation of the line that passes through the points (1,1) and (3,5)?

$$\frac{1-5}{1-3} = \frac{-4}{-2} = 2$$

$$y - 1 = 2(x-1) \quad \text{or} \quad y - 5 = 2(x-3)$$

Practice:

Write the slope-intercept form of the equation of each line given the slope and y-intercept.

1) Slope = $\frac{5}{2}$, y-intercept = 0

$$y = \frac{5}{2}x$$

2) Slope = 1, y-intercept = 1

$$y = x + 1$$

3) Slope = $-\frac{7}{2}$, y-intercept = 3

$$y = \frac{-7}{2}x + 3$$

4) Slope = −1, y-intercept = −2

$$y = -x - 2$$

Find the slope and y-intercept for each table, and then write an equation.

x	0	1	2	3	4
y	0	2	4	6	8

$m = 2$
$b = 0$

$$y = 2x$$

$(0,0)$
$(1,2)$ $m = \frac{2-0}{1-0} = \frac{2}{1} = 2$

x	0	1	2	3	4
y	3.5	4.5	5.5	6.5	7.5

$(0, 3.5)$
$(1, 4.5)$ $m = \frac{4.5 - 3.5}{1 - 0} = \frac{1}{1} = 1$

$m = 1$
$b = 3.5$

$$y = x + 3.5$$

x	1	2	3	4	5
y	1	3	5	7	9

$(1,1)$
$(2,3)$ $m = \frac{3-1}{2-1} = \frac{2}{1} = 2$

$y - 1 = 2(x - 1)$
$y - 1 = 2x - 2$

$$y = 2x - 1$$

x	0	1	2	3	4
y	5	3	1	−1	−3

$(0,5)$
$(1,3)$ $m = \frac{3-5}{1-0} = \frac{-2}{1} = -2$

$m = -2$
$b = 5$

$$y = -2x + 5$$

x	2	3	4	5	6
y	−11	−14	−17	−20	−23

$(2, -11)$
$(3, -14)$ $m = \frac{-14 - (-11)}{3 - 2} = \frac{-3}{1} = -3$

$y + 11 = -3(x - 2)$
$y + 11 = -3x + 6$

$$y = -3x - 5$$

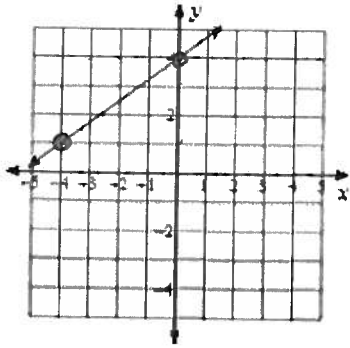| x	−3	−2	−1	0
y	7	5	3	1

$(-3, 7)$
$(-2, 5)$ $m = \frac{5 - 7}{-2 - (-3)} = \frac{-2}{1} = -2$

$m = -2$
$b = 1$

$$y = -2x + 1$$

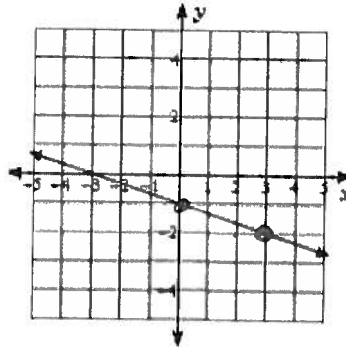**Write the slope-intercept form of the equation of each line.**
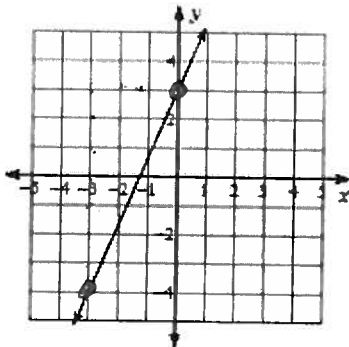
1)

$b=4$
$m=\dfrac{3}{4}$
$y=\dfrac{3}{4}x+4$

2)

$b=-1$
$m=-\dfrac{1}{3}$
$y=-\dfrac{1}{3}x-1$

3)

$b=3$
$m=\dfrac{7}{3}$
$y=\dfrac{7}{3}x+3$

4)
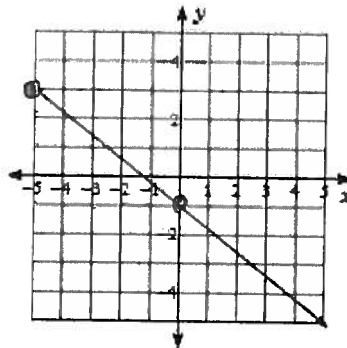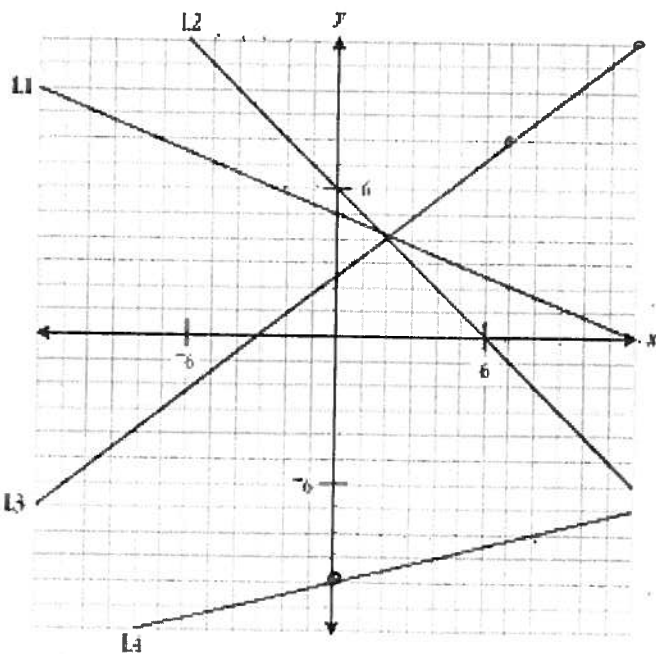

$b=-1$
$m=-\dfrac{4}{5}$
$y=-\dfrac{4}{5}x-1$

Write an equation for each of the four lines shown on the graph below.

#11 $b=5$
$m=-\dfrac{1}{2}$
$y=\dfrac{1}{2}x+5$

#12 $b=6$
$m=1$
$y=x+6$

#13 $(7,8)$
$(12,12)$
$m=\dfrac{12-8}{12-7}=\dfrac{4}{5}$
$y-8=\dfrac{4}{5}(x-7)$

#14 $b=-10$
$m=\dfrac{1}{4}$
$y=\dfrac{1}{4}x-10$