8. To determine whether the pair of lines is parallel, coincident, or intersecting, rewrite each equation in slope-intercept form, compare their slopes, and, if necessary, compare their y-intercepts.

L: $x + y = -4$, so $y = -x - 4$

M: $3x + 3y = -12$, so $3y = -3x - 12$, so $y = -x - 4$

L: slope: $m = -1$; y-intercept: $(0, -4)$

M: slope: $m = -1$; y-intercept: $(0, -4)$

Since both the slopes the y-intercepts of the two lines are the same, the lines are coincident.

10. To determine whether the pair of lines is parallel, coincident, or intersecting, rewrite each equation in slope-intercept form, compare their slopes, and, if necessary, compare their y-intercepts.

L: $4x - 2y = -7$, so $-2y = -4x - 7$, so $y = 2x + \frac{7}{2}$

M: $-2x + y = -2$, so $y = 2x - 2$

L: slope: $m = 2$; y-intercept: $\left(0, \frac{7}{2}\right)$

M: slope: $m = 2$; y-intercept: $(0, -2)$

The slopes of the two lines are the same, but the y-intercepts are different, so the lines are parallel.

12. To determine whether the pair of lines is parallel, coincident, or intersecting, rewrite each equation in slope-intercept form, compare their slopes, and, if necessary, compare their y-intercepts.

L: $4x + 3y = 2$, so $3y = -4x + 2$, so $y = -\frac{4}{3}x + \frac{2}{3}$

M: $2x - y = -1$, so $-y = -2x - 1$, so $y = 2x + 1$

L: slope: $m = -\frac{4}{3}$

M: slope: $m = 2$

Since the slopes of the two lines are different, the lines intersect.

20. To find the point of intersection of two lines, first put the lines in slope-intercept form.

L: $4x - 2y = 8$, so $y = 2x - 4$

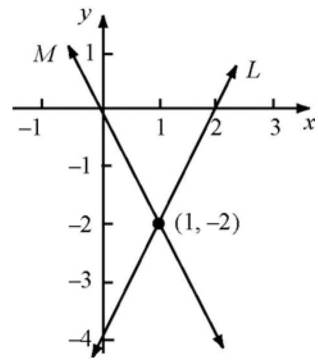
M: $6x + 3y = 0$, so $y = -2x$

Since the point of intersection, (x_0, y_0), must be on both L and M, we set the two equations equal to each other and solve for x_0. Then we substitute the value of x_0 into the equation of one of the lines to find y_0.

$$2x_0 - 4 = -2x_0$$
$$4x_0 = 4$$
$$x_0 = 1$$

$$y_0 = -2(1)$$
$$y_0 = -2$$

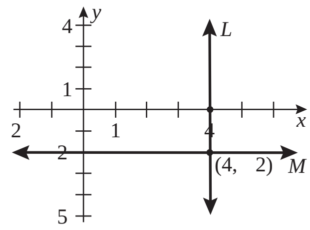
The point of intersection is $(1, -2)$.



25. L is the vertical line on which the x-value is always 4.

M is the horizontal line on which y-value is always –2.

The point of intersection is (4, –2).



27. L is parallel to $y = 2x$, so the slope of L is $m = 2$. We are given the point (3, 3) on line L. Use the point-slope form of the line.

$$y - y_1 = m(x - x_1)$$
$$y - 3 = 2(x - 3)$$
$$y - 3 = 2x - 6$$

slope-intercept form: $y = 2x - 3$

general form: $2x - y = 3$

30. We want a line parallel to $y = -3x$. So our line will have slope $m = -3$. It must also contain the point (−1, 2). Use the point slope form of the equation of a line:

$$y - y_1 = m(x - x_1)$$
$$y - 2 = -3(x + 1)$$
$$y - 2 = -3x - 3$$

slope-intercept form: $y = -3x - 1$

general form: $3x + y = -1$

36. To find the equation of the line parallel to the line containing the points (–4, 5) and (2, −1), first find the slope of the line containing the two points.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5-(-1)}{(-4)-2} = \frac{6}{-6} = -1$$

The slope of a line parallel to the line containing these points is also –1. Use the slope and the point (–2, –5) to write the point-slope form of the parallel line.

$$y - y_1 = m(x - x_1)$$
$$y + 5 = -1(x + 2)$$
$$y + 5 = -x - 2$$

Solve for y to get the slope-intercept form: $y = -x - 7$

Rearrange terms to obtain the general form of the equation: $x + y = -7$

38. Let x denote the number of anthropology degrees earned by males, and y denote the number earned by females. There are two linear relationships here. One relates x and y with the total number of degrees awarded, and the other relates the number of degrees earned by females to the number earned by males. So we have $x + y = 7418$ and $y = 2x + 566$. We need to find the point of intersection of the two lines. We write the first equation in slope-intercept form, and then find the point (x_0, y_0) that satisfies both equations.

$$x + y = 7418$$
$$y = -x + 7418$$

Setting the equations equal, we find

$$-x_0 + 7418 = 2x_0 + 566$$
$$7418 - 566 = 2x_0 + x_0$$
$$6852 = 3x_0$$
$$x_0 = 2284$$

Using $x_0 = 2284$ in the first equation, we get $y_0 = -2284 + 7418 = 5134$
5134 females earned bachelor's degrees in anthropology in 2003-04.

43. Let x denote the amount of Kona coffee and y denote the amount of Columbian coffee in the mix. We will use the hint and assume that the total weight of the blend is 100 pounds.

Coffee	Amount Mixed	Price per Pound	Total Value
Kona	x	\$22.95	\$22.95x
Columbian	$y = 100 - x$	\$ 6.75	\$6.75y = \$6.75(100 – x)
Mixture	$x + y = 100$	\$10.80	\$10.80(100) = \$1080

The last column gives the information necessary to write the equation, since the sum of the values of each of the two individual coffees must equal the total value of the mixture.

$$22.95x + 6.75(100 - x) = 10.80(100)$$
$$22.95x + 675 - 6.75x = 1080$$
$$16.2x = 405$$
$$x = 25$$

Mix 25 pounds of Kona coffee with 75 pounds of Columbian coffee to obtain a blend worth \$10.80 per pound.

44. Let x denote the number of adult tickets sold and y denote the number of child tickets sold. We will use a table to organize the information needed to solve this problem.

Tickets	Number Sold	Price per Ticket	Revenue
Adult	x	\$8.00	\$8x
Child	$y = 2600 - x$	\$4.00	\$4y = \$4(2600 – x)
Total	$x + y = 2600$		\$16,440

The last column of the table contains the information necessary to solve the mixture problem, because the revenue from the adult's tickets plus the revenue from the children's tickets must equal the total revenue.

$$8x + 4(2600 - x) = 16,440$$
$$8x + 10,400 - 4x = 16,440$$
$$4x = 6040$$
$$x = 1510$$

There were 1510 adult patrons during the week.]