SECTION 6A Ready To Go On? Quiz

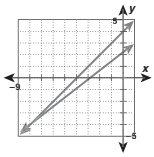
6-1 Solving Systems by Graphing

Tell whether the ordered pair is a solution of the given system.

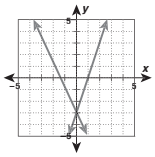
1. $(-1, 4)$; $\begin{cases} y = -3x + 1 \\ y = x + 5 \end{cases}$ — Yes
2. $(1, 5)$; $\begin{cases} x - 3y = 2 \\ 2x - 5y = 5 \end{cases}$ — No
3. $(8, -2)$; $\begin{cases} y = -\frac{1}{4}x \\ y + 3x = 22 \end{cases}$ — Yes

Solve each system by graphing.

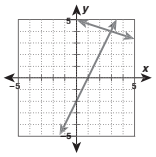
4. $\begin{cases} y = x + 4 \\ y = \frac{3}{4}x + 2 \end{cases}$ — $(-8, -4)$



5. $\begin{cases} y = -2x - 3 \\ 3x - y = 3 \end{cases}$ — $(0, -3)$



6. $\begin{cases} \frac{1}{3}x + y = 5 \\ 4x - 2y = 4 \end{cases}$ — $(3, 4)$



7. Bill and Steve both owe their mother money. Bill owes his mother \$300 and plans to pay her \$25 every week. Steve owes his mother \$550 and plans to pay her \$75 every week. After how many weeks will they both owe their mother the same amount of money? What amount will that be?

5 weeks; They will both owe \$175.

6-2 Solving Systems by Substitution

Solve each system by substitution.

8. $\begin{cases} y = x - 2 \\ 4x + y = 8 \end{cases}$ — $(2, 0)$
9. $\begin{cases} -4x + 2y = -6 \\ 3x + y = 2 \end{cases}$ — $(1, -1)$
10. $\begin{cases} -y = x \\ y = 3x + 4 \end{cases}$ — $(-1, 1)$
11. $\begin{cases} y = x + 10 \\ -2x - 10y = -52 \end{cases}$ — $(-4, 6)$
12. $\begin{cases} y = -x \\ -y = 4x + 9 \end{cases}$ — $(-3, 3)$
13. $\begin{cases} y = 6x - 3 \\ y = x + 5 \end{cases}$ — $\left(\frac{8}{5}, \frac{33}{5}\right)$

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SECTION 6A Ready to Go On? Quiz continued

6-3 Solving Systems by Elimination

Solve each system by elimination.

14. $\begin{cases} x + 2y = 20 \\ 3x - 2y = -12 \end{cases}$ — $(2, 9)$
15. $\begin{cases} x + y = 5 \\ 3x + y = -11 \end{cases}$ — $(-8, 13)$
16. $\begin{cases} 4x + 3y = 19 \\ -3x + 4y = -8 \end{cases}$ — $(4, 1)$
17. $\begin{cases} x - y = 12 \\ 2x + y = 0 \end{cases}$ — $(4, -8)$
18. $\begin{cases} 12x - 6y = 9 \\ 6y - 9x = 3 \end{cases}$ — $(4, 6.5)$
19. $\begin{cases} -x - y = 8 \\ -2x - y = 10 \end{cases}$ — $(-2, -6)$

20. Chris sold 180 cookies and cupcakes over the weekend at a bake sale. The cupcakes sold for \$0.50 each and the cookies sold for \$0.25 each. If Chris collected \$66 how many of each did Chris sell?

96 cookies and 84 cupcakes

6-4 Solving Special Systems

Solve each system of linear equations.

21. $\begin{cases} y = -x - 3 \\ x + y = 4 \end{cases}$ — No solution
22. $\begin{cases} x - y = 5 \\ 3x - 3y = 12 \end{cases}$ — No solution
23. $\begin{cases} y = -3x + 5 \\ 3x + y = 5 \end{cases}$ — Infinitely many solutions
24. $\begin{cases} -x - y = 7 \\ x + y = 2 \end{cases}$ — No solution
25. $\begin{cases} y = 6x + 2 \\ y - 6x = 2 \end{cases}$ — Infinitely many solutions
26. $\begin{cases} 3x - y = 12 \\ y = -3x + 1 \end{cases}$ — No solution

Classify each system. Give the number of solutions.

27. $\begin{cases} 2y = 1 - \frac{1}{2}x \\ x = 2 - 4y \end{cases}$ — Consistent, dependent; infinitely many solutions
28. $\begin{cases} y = -3x + 1 \\ 3x + y = -1 \end{cases}$ — Inconsistent; no solution
29. $\begin{cases} 4x - 3y = 12 \\ y = 3(x - 4) \end{cases}$ — Consistent, independent; one solution

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SECTION 6A Ready to Go On? Enrichment

Using a Matrix to Represent a System of Equations

A matrix is a rectangular array of numbers enclosed in a single set of brackets. If each equation in a system of equations is written in standard form, you can represent the system with a matrix equation. The matrix equation is made up of three matrices; one for the coefficients on the variables x and y, one for the variables x and y, and one for the constants.

For example, the system of equations $\begin{cases} 3x - y = 6 \\ x + y = -2 \end{cases}$ is represented by the matrix equation $\begin{bmatrix} 3 & -1 \\ 1 & 1 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 6 \\ -2 \end{bmatrix}$.

Determine which system of equations represents the correct matrix equation.

1. ___d___ $\begin{cases} x + y = 8 \\ x - y = 2 \end{cases}$
2. ___a___ $\begin{cases} 3x - y = 4 \\ 6x + 2y = -8 \end{cases}$
3. ___b___ $\begin{cases} x - y = 2 \\ 2x + 3y = 9 \end{cases}$
4. ___c___ $\begin{cases} -5x + 8y = 21 \\ 10x + 3y = 15 \end{cases}$

a. $\begin{bmatrix} 3 & -1 \\ 6 & 2 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 4 \\ -8 \end{bmatrix}$

b. $\begin{bmatrix} 1 & -1 \\ 2 & 3 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 2 \\ 9 \end{bmatrix}$

c. $\begin{bmatrix} -5 & 8 \\ 10 & 3 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 21 \\ 15 \end{bmatrix}$

d. $\begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 8 \\ 2 \end{bmatrix}$

Create a matrix equation for each system of equations.

5. $\begin{cases} x - 5y = 0 \\ 2x - 3y = 7 \end{cases}$ — $\begin{bmatrix} 1 & -5 \\ 2 & -3 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 0 \\ 7 \end{bmatrix}$
6. $\begin{cases} 4x + 3y = 19 \\ 3x - 4y = 8 \end{cases}$ — $\begin{bmatrix} 4 & 3 \\ 3 & -4 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 19 \\ 8 \end{bmatrix}$
7. $\begin{cases} 5x + 3y = 12 \\ 4x - 5y = 17 \end{cases}$ — $\begin{bmatrix} 5 & 3 \\ 4 & -5 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 12 \\ 17 \end{bmatrix}$
8. $\begin{cases} x + y = 7 \\ x - y = 9 \end{cases}$ — $\begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 7 \\ 9 \end{bmatrix}$
9. $\begin{cases} 12x - 9y = 114 \\ 12x + 7y = 82 \end{cases}$ — $\begin{bmatrix} 12 & -9 \\ 12 & 7 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 114 \\ 82 \end{bmatrix}$
10. $\begin{cases} 2x - 3y = -4 \\ x + 3y = 7 \end{cases}$ — $\begin{bmatrix} 2 & -3 \\ 1 & 3 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -4 \\ 7 \end{bmatrix}$
11. $\begin{cases} \frac{1}{2}x + y = 12 \\ x + \frac{1}{5}y = 10 \end{cases}$ — $\begin{bmatrix} \frac{1}{2} & 1 \\ 1 & \frac{1}{5} \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 12 \\ 10 \end{bmatrix}$
12. $\begin{cases} \frac{2}{3}x + \frac{1}{3}y = -9 \\ \frac{1}{4}x + \frac{3}{4}y = 16 \end{cases}$ — $\begin{bmatrix} \frac{2}{3} & \frac{1}{3} \\ \frac{1}{4} & \frac{3}{4} \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -9 \\ 16 \end{bmatrix}$
13. $\begin{cases} 1.2x - 1.6y = 2.4 \\ -0.8x + 0.2y = -1.2 \end{cases}$ — $\begin{bmatrix} 1.2 & -1.6 \\ -0.8 & 0.2 \end{bmatrix}\begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 2.4 \\ -1.2 \end{bmatrix}$

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SECTION 6B Ready To Go On? Skills Intervention

6-5 Solving Linear Inequalities

Find these vocabulary words in Lesson 6-5 and the Multilingual Glossary.

Vocabulary	
linear inequality	solution of a linear inequality

Identifying Solutions of Inequalities

Tell whether the ordered pair, $(-4, -2)$, is a solution of the inequality, $y \leq -3x + 6$.

To be a solution to the inequality, the ordered pair must make the inequality ___true___.

Substitute the ordered pair $(-4, -2)$ into the inequality. Let $x =$ ___−4___ and $y =$ ___−2___.

$y \leq -3x + 6$

$-2 \stackrel{?}{\leq} -3(-4) + 6$

$-2 \stackrel{?}{\leq} 12 + 6$

$-2 \leq 18$

Does the ordered pair $(-4, -2)$ make the inequality true? ___Yes___

Therefore the ordered pair $(-4, -2)$ ___is___ a solution to the inequality $y \leq -3x + 6$.

Graphing Linear Inequalities in Two Variables

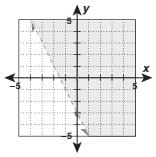
Graph the solutions of the linear inequality, $y > -2x - 3$.

The inequality, $y > -2x - 3$, is in ___slope-intercept___ form.

The ___boundary___ line is given by the equation y ___=___ $-2x - 3$.

The slope of this line is ___−2___. The y-intercept of this line is $(0,$ ___−3___$)$.

Use the slope and y-intercept to plot the boundary line.



Start at the point $(0,$ ___−3___$)$ and go up ___2___ units and left ___1___ unit. Plot the point.

Make the boundary line a ___dashed___ line because the inequality symbol is not "or equal to."

The inequality symbol is ___>___, so should the solutions be located in the half-plane above or below the line? ___Above___ Shade this region to represent the solutions.

Check: Choose the point (0, 0) and substitute it into the inequality.

$y > -2x - 3 \longrightarrow 0 > -2(0) - 3 \longrightarrow 0 > -3$

Does the point make the inequality true? ___Yes___ Did you shade correctly? ___Yes___

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SECTION 6B

Ready to Go On? Problem Solving Intervention

6-5 Solving Linear Inequalities

A solution to a linear equality lies in a half-plane with other ordered pairs that make the inequality true.

Janel has $10 to buy pencils and paper. Pencils sell for $1.50 per dozen and paper sells for $0.50 per package. Write a linear inequality to represent the situation. Then graph the linear inequality and give two possible combinations of pencils and paper that Janel can buy.

Understand the Problem

1. How much money does Janel have? $10
2. A dozen pencils cost $1.50 and a package of paper cost $0.50.

Make a Plan

Let x represent the dozens of pencils and y represent the number of packages of paper.

3. (1.50)(dozens of pencils) + (0.50)(packages of paper) ≤ $10

   (1.5) · x + (0.50) · y ≤ 10

4. Write the inequality in slope-intercept form:

   $1.5x + \boxed{0.5}y \le 10$ — The slope of the boundary line is −3.

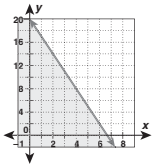
   $0.5y \le 10 - \boxed{1.5x}$ — The y-intercept of the boundary line is (0, 20).

   $\frac{0.5y}{0.5} \le \frac{10}{0.5} - \frac{\boxed{1.5x}}{0.5}$ — The symbol is "≤" so the boundary line is solid.

   $y \le 20 - \boxed{3}x$ — Shade the half-plane under the boundary line.

Solve

5. Graph the inequality and shade the correct half-plane.



6. Choose two combinations: (2, 2) and (1, 5).

Look Back

7. Substitute your combinations into the inequality from Exercise 3.

   $y \le 20 - 3x$ $\quad$ $y \le 20 - 3x$

   2 ≤ 20 − 3(2) $\quad$ 5 ≤ 20 − 3(1)

   2 ≤ 14 $\quad$ 5 ≤ 17

   So Janel can buy 2 dozen pencils and 2 packages of paper or 1 dozen pencils and 5 packages of paper.

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SECTION 6B

Ready To Go On? Skills Intervention

6-6 Solving Systems of Linear Inequalities

Find these vocabulary words in Lesson 6-6 and the Multilingual Glossary.

Vocabulary	
system of linear inequalities	solution of a system of linear inequalities

Identifying Solutions of Systems of Linear Inequalities

Tell whether the ordered pair (−3, 1) is a solution of the system, $\begin{cases} y < -x + 3 \\ y \ge x - 2 \end{cases}$.

To be a solution to the system of inequalities, the ordered pair (−3, 1) has to make both inequalities true. Let x = −3 and let y = 1.

Substitute $x = -3$ and $y = 1$ into $y < -x + 3$.

1 < −(−3) + 3

1 < 3 + 3

1 < 6

The point (−3, 1) makes this inequality true.

Substitute $x = -3$ and $y = 1$ into $y \ge x - 2$.

1 ≥ −3 − 2

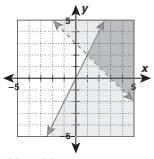
1 ≥ −5

The point (−3, 1) makes this inequality true.

Since the point (−3, 1) makes both inequalities true, it is a solution to the system.

Solving a System of Linear Inequalities by Graphing

Graph the system of inequalities $\begin{cases} y > -x + 3 \\ y \le 2x \end{cases}$. **Give two ordered pairs that are solutions and two that are not solutions.**



$y > -x + 3$ The y-intercept is (0, 3) and the slope = −1. Use this information to draw a dashed line. Because the symbol is greater than, shade the half-plane above the line.

$y \le 2x$ The y-intercept is (0, 0) and the slope = 2. Use this information to draw a solid line. Because the symbol is less than or equal to, shade the half-plane below the line.

Look at the graph. Are (2, 3) and (4, 1) solutions? Yes

Are (0, 0) and (1, −1) solutions? No

Did you shade the graph correctly? Yes

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SECTION 6B

Ready to Go On? Problem Solving Intervention

6-6 Solving Systems of Linear Inequalities

The solutions to a system of linear inequalities are located in the intersection of the half-planes.

As a fundraiser, the chess club sells hotdogs and hamburgers. They make $1 for every hotdog and $2 for every hamburger they sell. The club cannot sell more than 100 hotdogs or 200 hamburgers. The club's goal is to make at least $200 in total profit. Show and describe possible combinations of hotdogs and hamburgers that can be sold to meet the goal.

Understand the Problem

1. How much does the club earn from each hotdog? $1 Each hamburger? $2
2. How many hotdogs do they have to sell? 100 Hamburgers? 200
3. How many inequalities need to be written? 3

Make a Plan

Let x represent the number of hotdogs and y represent the number of hamburgers.

4.

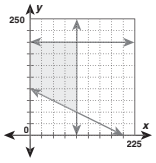
The club cannot sell more than 100 hotdogs.	The club cannot sell more than 200 hamburgers.	Profit from hotdogs + Profit from hamburgers ≥ 200
$x \le$ 100	$y \le$ 200	$1x + \boxed{2}y \ge \boxed{200}$

5. Graph each inequality on the coordinate system.

Inequality	Boundary Line	Dashed or Solid Line	Shaded Region
$x \le$ 100	Vertical line at x = 100	Solid line	Shade to the left of the line.
$y \le$ 200	Horizontal line at y = 200	Solid line	Shade under the line.
$1x + \boxed{2}y \ge \boxed{200}$	x-intercept: (200, 0) y-intercept: (0, 100)	Solid line	Shade above the line.

Solve

6. Graph each inequality and shade the correct half-planes.



7. Are the points (50, 100), (75, 150), and (80, 175) located in the intersection of all three regions? Yes

Look Back

8. Check that the x-coordinates of each point are less than 100 and that the y-coordinates are less than 200. Does each point make the inequality $x + 2y \ge 200$ true? Yes

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SECTION 6B

Ready To Go On? Quiz

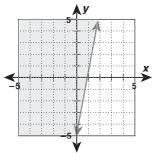
6-5 Solving Linear Inequalities

Tell whether the ordered pair is a solution of the inequality.

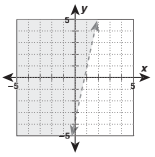
1. (4, −3); $y < -3x + 2$ — No
2. (5, 18); $y \ge 4x - 6$ — Yes
3. (2, −4); $y \le 5x - 12$ — Yes

Graph the solutions of each linear inequality.

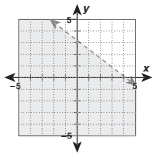
4. $y \ge 5x - 4$



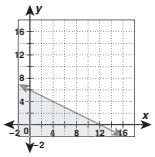
5. $4x - y < 3$



6. $3x + 4y < 12$



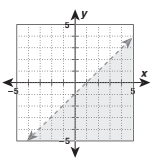
7. Barbara has no more than $144 to buy jewelry. Earrings cost $12 each and necklaces cost $24 each. How many of each can she buy? Write a linear inequality to describe the situation. Graph the linear inequality and give three possible combinations of earrings and necklaces Barbara can buy.



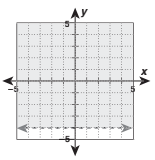
$12x + 24y \le 144$; Sample Answers: 10 pairs of earrings and 1 necklace; 7 pairs of earrings and 2 necklaces; 1 pair of earrings and 4 necklaces

Write an inequality to represent each graph.

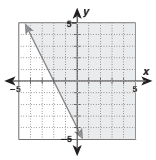
8. $y < x - 1$



9. $y > -4$



10. $y \ge -2x - 4$



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SECTION 6B Ready to Go On? Quiz continued

6-6 Solving Systems of Linear Inequalities

Tell whether the ordered pair is a solution of the given system.

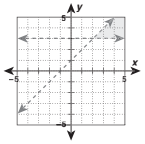
11. $(-1, -4)$; $\begin{cases} y < -3x \\ y > x - 4 \end{cases}$ — Yes

12. $(3, 2)$; $\begin{cases} y \le x + 2 \\ y \ge -3x - 2 \end{cases}$ — Yes

13. $(0, 0)$; $\begin{cases} y \ge 2x \\ 2x + y < -4 \end{cases}$ — No

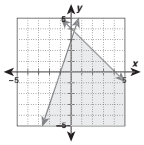
Graph each system of linear inequalities. Give two ordered pairs that are solutions and two that are not solutions.

14. $\begin{cases} y > 3 \\ y < x + 1 \end{cases}$



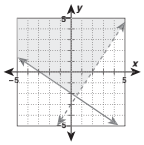
Sample Answers: solutions: (4, 4), (5, 5); not solutions: (0, 0), (−1, 2)

15. $\begin{cases} x + y \le 4 \\ 3x - y \ge -3 \end{cases}$



Sample Answers: solutions: (0, 0), (1, 1); not solutions: (−2, 1), (5, 1)

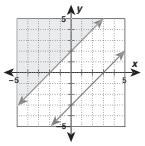
16. $\begin{cases} 3x - 2y < 6 \\ 2x + 3y \ge -6 \end{cases}$



Sample Answers: solutions: (0, 0), (−1, 1); not solutions: (5, 1), (3, −2)

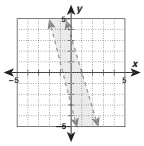
Graph each system of linear inequalities and describe the solutions.

17. $\begin{cases} y \ge x + 2 \\ y \ge x - 3 \end{cases}$



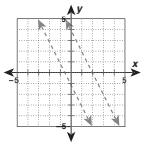
The same as the solutions of $y \ge x + 2$.

18. $\begin{cases} y > -3x - 2 \\ y < -3x + 3 \end{cases}$



All points between the lines.

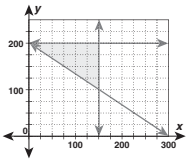
19. $\begin{cases} y > -2x + 4 \\ y < -2x - 1 \end{cases}$



No solution

20. A vendor sells hotdogs for $2.00 and sausage for $3.00. The vendor begins each day with 150 hotdogs and 200 sausages. The vendor wants to make at least $600. Graph and describe all possible combinations of sandwiches that could be sold to meet the goal. List two possible combinations.

Sample Answers: (100, 150) and (150, 200)



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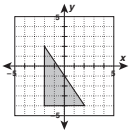
SECTION 6B Ready to Go On? Enrichment

Describing Geometric Regions with a System of Inequalities

Describe the shaded region of the graph by writing a system of inequalities consisting of three different linear inequalities. To write this system, follow these steps:

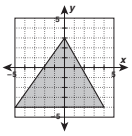
1. Determine the slope and *y*-intercept of each line.
2. Write inequalities in slope-intercept form.
3. If the line is solid use either $\le$ or $\ge$. If the line is dashed, use either $<$ or $>$.
4. If the shaded region is "above" the line use the symbol $>$, and if the shaded region is "below" the line, use the symbol $<$.

For example, the system of inequalities that describes the region below is $\begin{cases} x \ge -2 \\ y \ge -4 \\ y \le \frac{-3}{2}x - 1 \end{cases}$.



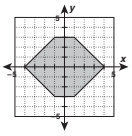
Write a system of inequalities that describes each region.

1.



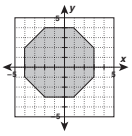
$\begin{cases} y \le \frac{3}{2}x + 3 \\ y \le \frac{-7}{4}x + 3 \\ y \ge -4 \end{cases}$

2.



$\begin{cases} y \le 3 & y \ge -3 \\ y \ge x - 4 & y \ge -x - 4 \\ y \le -x + 4 & y \le x + 4 \end{cases}$

3.



$\begin{cases} x \ge -4 & x \le 3 & y \ge -x - 5 \\ y \le 4 & y \ge -3 & y \le x - 4 \\ y \ge -x + 5 & & y \le x + 6 \end{cases}$

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SECTION 7A Ready To Go On? Skills Intervention

7-1 Integer Exponents

Evaluating Expressions with Zero and Negative Exponents

Zero Exponent: Any nonzero number raised to the zero power is 1.

$4^0 = 1$

Negative Exponent: A nonzero number raised to a negative exponent is equal to one divided by that number raised to the opposite exponent.

$3^{-4} = \frac{1}{3^4}$

Evaluate each expression for the given value(s) of the variable(s).

A. $a^{-3}b^2$ for $a = 2$ and $b = 3$

$2^{-3} \cdot 3^2$ — Substitute 2 for a and 3 for b.

$= \frac{1}{2^3} \cdot 9$ — Use the definition $x^{-n} = \frac{1}{x^n}$ and simplify.

$= \frac{1}{2 \cdot 2 \cdot 2} \cdot 9$ — Write the power in the denominator as a product.

$= \frac{1}{8} \cdot 9$ — Evaluate the power in the denominator.

$= \frac{9}{8}$ — Simplify.

B. x^0y^{-3} for $x = 7$ and $y = -5$

$7^0 \cdot (-5)^{-3}$ — Substitute 7 for x and -5 for y.

$= 1 \cdot \frac{1}{(-5)^3}$ — Any nonzero number raised to the zero power is 1 and $x^{-n} = \frac{1}{x^n}$.

$= 1 \cdot \frac{1}{-125}$ — Evaluate the power.

$= -\frac{1}{125}$ — Simplify.

Simplifying Expressions with Zero and Negative Exponents

A. $9a^{-7}$

$9a^{-7} = 9 \cdot \frac{a^{-7}}{}$

$= 9 \cdot \frac{1}{a^7}$

$= \frac{9}{a^7}$

B. $\frac{x^{-6}}{y^{-4}}$

$\frac{x^{-6}}{y^{-4}} = x^{-6} \cdot \frac{1}{y^{-4}}$

$= \frac{1}{x^6} \cdot \frac{y^4}{1} = \frac{y^4}{x^6}$

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SECTION 7A Ready To Go On? Skills Intervention

7-2 Powers of 10 and Scientific Notation

Find this vocabulary word in Lesson 7-2 and the Multilingual Glossary.

Vocabulary
scientific notation

Positive Integer Exponent: If n is a positive integer, find the value of 10^n by starting with 1 and moving the decimal point n places to the right.

Negative Integer Exponent: If n is a negative integer, find the value of 10^n by starting with 1 and moving the decimal point n places to the left.

Evaluating Powers of 10

Find the value of 10^7.

Is the exponent positive or negative? Positive

Start with 1 and move the decimal point 7 places to the right.

$100\underbrace{0\ 0\ 0\ 0\ 0}$. So, 10^7 = 10,000,000.

Writing Powers of 10

Write each number as a power of 10.

A. 0.00001

$0.\underbrace{0\ 0\ 0\ 0\ 1}$ — The decimal point is 5 places to the left of 1, so should the exponent be positive or negative? Negative

$0.00001 = 10^{-5}$

B. 10,000,000,000

$1\underbrace{0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0}$. — The decimal point is 10 places to the right of 1, so should the exponent be positive or negative? Positive

$10{,}000{,}000{,}000 = 10^{10}$

Multiplying Powers of 10

Find the value of 16.3×10^6.

Move the decimal point 6 places to the right.

$16.\underbrace{3\ 0\ 0\ 0\ 0\ 0}$. = 16,300,000

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