Student: _____ **Date:** _____	**Instructor:** Imelda Valencia **Course:** Algebra 2 private	**Assignment:** Summer Homework for those who will be taking Algebra 2 (MS and HS) Sy 2017-2018

1. Solve the equation. Check your solution.

   $4 + 4q = 9 + 3q$

   $q =$ _____

2. Solve the equation. Check your solution.

   $4x - 8 = 20x + 4$

   $x =$ _____ (Simplify your answer. Type an integer or a simplified fraction.)

3. Solve the equation. Check your answer.

   $6y - 10 - 3y + 5 = 0$

   $y =$ _____
   (Simplify your answer. Type an integer or a fraction.)

4. Solve the equation.

   $24 - (x + 5) = 8x - 8$

   The solution is $x =$ _____.

5. Solve the equation. Check your solution.

   $3(x + 6) = 33$

   $x =$ _____ (Simplify your answer. Type an integer or a fraction.)

6. A new Youth Sports Center is being built in Junction City. The perimeter of the rectangular playing field is 338 yards. The length of the field is 8 yards less than double the width. What are the dimensions of the playing field?

   The width is _____ yards.

   The length is _____ yards.

7. Is the equation always, sometimes, or never true?

   $4x - 8 + 2x = 4 + 6x - 11$

   Choose the correct answer below.

   - ○ Always true
   - ○ Sometimes true
   - ○ Never true

8. Solve the formula for the indicated variable.

   $I = PRT$ for R

   $R =$ _____

9. Solve the equation for y.

$yw + yq = r$

$y =$ _____

10. Solve for p.

$G = \frac{8}{7}(p - 46)$

The solution is $p =$ _____ $G +$ _____.
(Simplify your answers. Type an integer or a fraction.)

11. Solve the equation.

$24 - 3(2w + 1) = 9w - 3(9 + w)$

$w =$ _____ (Simplify your answer.)

12. Solve the formula for the indicated variable.

$T(r + s) = rs$, for s

$s =$ _____ (Simplify your answer.)

13. Solve the following inequality. Graph the solution.

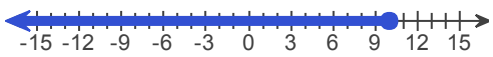
$6a - 21 > 39$

What is the solution? Select the correct choice below and fill in the answer box within your choice.

(Type an integer or a decimal.)

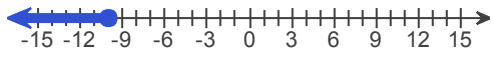
- **A.** $a <$ _____
- **B.** $a >$ _____
- **C.** $a \leq$ _____
- **D.** $a \geq$ _____

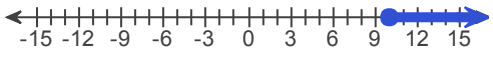
Choose the correct graph below.

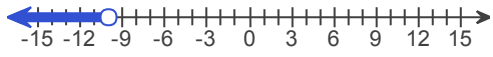
- **A.** 

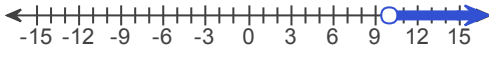
- **B.** 

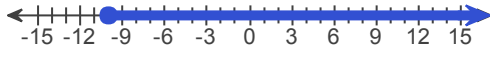
- **C.** 

- **D.** 

- **E.** 

- **F.** 

- **G.** 

- **H.** 

14. Solve the inequality. Graph the solution.

$6(m-5)+1<19$

What is the solution?

m (1) _____ _____

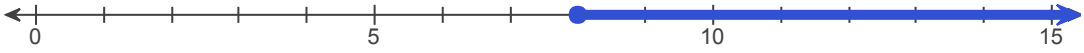
Choose the correct graph below.

A.

B.

C.

D.



(1) ○ <
○ >

15. Solve the inequality. Graph the solution.

$-5(w+6)+8<-47$

What is the solution? Select the correct choice below and fill in the answer box within your choice.

(Type an integer or a decimal.)

A. $w>$ _____

B. $w<$ _____

C. $w\leq$ _____

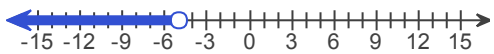
D. $w\geq$ _____

Choose the correct graph below.

A.

B.

C.



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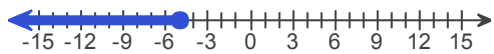
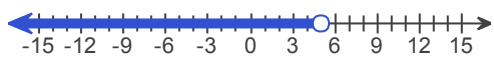
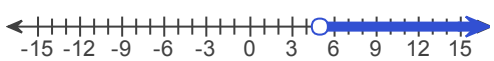


E.

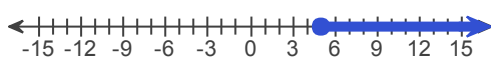
F.



G.



H.



16. Mark and Heather Starr are celebrating their 25th anniversary by having a reception at a local reception hall. They have budgeted $4,500 for their reception. If the reception hall charges a $50 cleanup fee plus $32 per person, find the greatest number of people that they may invite and still stay within their budget.

Mark and Heather can invite at most _____ people to the reception.
(Round down to the nearest whole person.)

17. Using the slope formula, find the slope of the line through the given points.

(6,6) and (1,1)

What is the slope of the line? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The slope of the line is _____. (Type an integer or a simplified fraction.)
- **B.** The slope of the line is undefined.

18. Using the slope formula, find the slope of the line through the given points.

$(-2, -9)$ and $(9, -9)$

What is the slope of the line? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The slope of the line is _____. (Type an integer or a simplified fraction.)
- **B.** The slope of the line is undefined.

19. Write the equation in slope-intercept form. Then find the slope and y-intercept of the line.

$3x + 5y = 12$

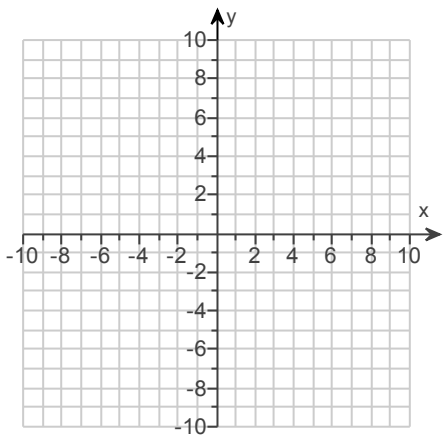
The equation in slope-intercept form is y = _____.
(Simplify your answer. Use integers or fractions for any numbers in the expression.)

The slope of the line is _____.
(Simplify your answer. Type an integer or a fraction.)

The y-intercept of the line is _____.
(Simplify your answer. Type an ordered pair. Use integers or fractions for any numbers in the expression.)

20. Use the slope-intercept form to graph the equation $y = 4x - 1$.

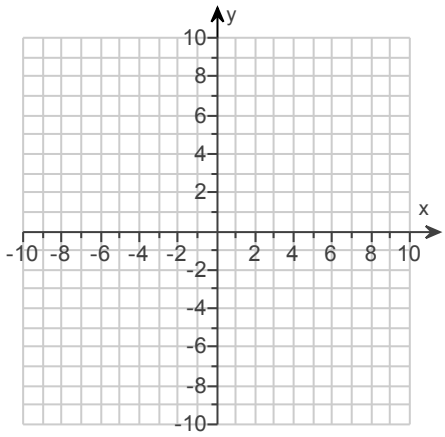
Use the graphing tool to graph the line. Use the slope and y-intercept when drawing the line.



21. Graph the equation.

$2x + 5y = 20$

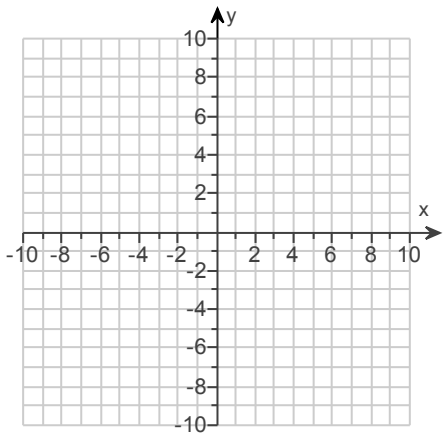
Use the graphing tool to graph the equation.



22. What is the graph of the inequality?

$8y \leq 12x$

Use the graphing tool to graph the inequality.



23. Is the ordered pair $\left(\frac{2}{9},0\right)$ a solution of the inequality?

$7x + y > 1$

Is the ordered pair a solution?

- ○ No
- ○ Yes

24. A freight elevator has a capacity of 3000 pounds.

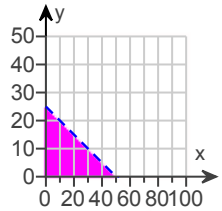
a) If a barrel averages 60 pounds and a crate 120 pounds, write an inequality that describes when x barrels and y crates will cause the elevator to be overloaded.

b) Graph the inequality.

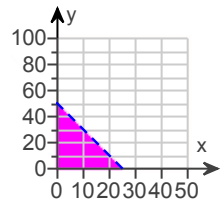
a) The inequality is _____.
(Use integers or fractions for any numbers in the inequality.)

b) Choose the correct graph below.

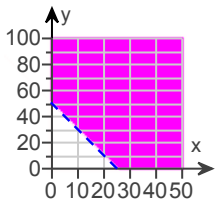
○ **A.**



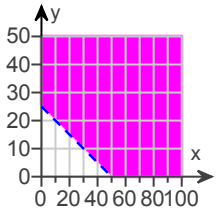
○ **B.**



○ **C.**



○ **D.**



25. Solve the system of equations by the substitution method.

$$\begin{cases} 5x - y = 45 \\ 4x + 3y = 17 \end{cases}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The solution of the system is _____.
  (Simplify your answer. Type an ordered pair. Use integers or fractions for any numbers in the expression.)
- **B.** There are infinitely many solutions.
- **C.** There is no solution.

26. Solve the system of equations using substitution.

$$\begin{aligned} 5x + y &= 16 \\ y &= 3x \end{aligned}$$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- **A.** The solution is _____.
  (Type an ordered pair.)
- **B.** There are infinitely many solutions.
- **C.** There is no solution.

27. Solve the system by substitution. Check your answer.

$$\begin{aligned} 2x + 7y &= 5 \\ x &= 3y + 9 \end{aligned}$$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- **A.** The solution is _____.
  (Simplify your answer. Type an ordered pair. Use integers or fractions for any numbers in the expression.)
- **B.** There are infinitely many solutions.
- **C.** There is no solution.

28. Solve the system by substitution.

$$\begin{aligned} 4x + 4y &= -16 \\ x + 7y &= 20 \end{aligned}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** There is one solution. The solution is _____.
  (Simplify your answer. Type an ordered pair. Use integers or fractions for any numbers in the expression.)
- **B.** There are infinitely many solutions.
- **C.** There is no solution.

29. A student has some $1 and $5 bills in his wallet. He has a total of 15 bills that are worth $51. How many of each type of bill does he have?

The student has _____ $1 bills and _____ $5 bills.
(Type whole numbers.)

30. Solve by the elimination method.

$9x + 4y = 14$

$-9x + y = 26$

What is the solution of the system? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** _____ (Type an ordered pair.)
- **B.** There are infinitely many solutions.
- **C.** There is no solution.

31. Solve by the elimination method.

$3x - 8y = 13$
$8x + 3y = 59$

What is the solution of the system? Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** _____ (Type an ordered pair.)
- **B.** There are infinitely many solutions.
- **C.** There is no solution.

32. Solve the system by elimination.

$$\begin{cases} 4x + 2y = 0 \\ 8x + 4y = 6 \end{cases}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The solution is _____.
  (Simplify your answer. Type an ordered pair. Use integers or fractions for any numbers in the expression.)
- **B.** There are infinitely many solutions.
- **C.** There is no solution.

33. Solve the system.

$$\begin{cases} \frac{1}{4}x + \frac{4}{5}y = 2 \\ \frac{5}{16}x - \frac{1}{5}y = 5 \end{cases}$$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- **A.** The solution is _____.
  (Simplify your answer. Type an ordered pair. Use integers or simplified fractions for any numbers in the expression.)
- **B.** There are infinitely many solutions.
- **C.** There is no solution.

34. A laboratory technician needs to make a 21-liter batch of a 40% acid solution. How can the laboratory technician combine a batch of an acid solution that is pure acid with another that is 10% to get the desired concentration?

The laboratory technician can combine _____ L of the pure acid solution with _____ L of the 10% acid solution to get the desired concentration.

35. A laboratory technician needs to make a 63-liter batch of a 20% acid solution. How can the laboratory technician combine a batch of an acid solution that is pure acid with another that is 10% to get the desired concentration?

The laboratory technician can combine _____ L of the pure acid solution with _____ L of the 10% acid solution to get the desired concentration.

*36. A metalworker has a metal alloy that is 25% copper and another alloy that is 60% copper. How many kilograms of each alloy should the metalworker combine to create 50 kg of a 46% copper alloy?

The metalworker should use _____ kilograms of the metal alloy that is 25% copper and _____ kilograms of the metal alloy that is 60% copper.
(Type whole numbers.)

*37. A bicycle store costs $1800 per month to operate. The store pays an average of $70 per bike. The average selling price of each bicycle is $90. How many bicycles must the store sell each month to break even?

The store must sell _____ bicycles each month to break even.
(Type a whole number.)

*38. An investor invested a total of $1,100 in two mutual funds. One fund earned a 9% profit while the other earned a 5% profit. If the investor's total profit was $83, how much was invested in each mutual fund?

The amount invested in the mutual fund that earned 9% was $_____.

The amount invested in the mutual fund that earned 5% was $_____.

*39. A group of scientists studied the effect of a chemical on various strains of bacteria. Strain A started with 6000 cells and decreased at a constant rate of 2000 cells per hour after the chemical was applied. Strain B started with 2000 cells and decreased at a constant rate of 1000 cells per hour after the chemical was applied. When will the strains have the same number of cells? Explain.

To determine when the strains will have the same number of cells, first write and solve a system of two linear equations.

The solution to the system of linear equations is _____.
(Type an ordered pair, but do not use commas in any individual coordinates.)

Consider the solution to the system of equations in the context of the problem. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.
(Simplify your answers.)

- **A.** The ordered-pair solution to the system of equations is viable for the situation. After _____ hours, the two strains will both have _____ cells.
- **B.** The ordered-pair solution to the system of equations is not viable for the situation, but there is a time when both strains have the same number of cells. After _____ hours, the two strains both have _____ cells.
- **C.** The ordered-pair solution to the system of equations is not viable for the situation. The two strains will never have the same number of cells.

*40. A traveler is walking on a moving walkway in an airport. The traveler must walk back on the walkway to get a bag he forgot. The traveler's ground speed is 2 ft/s against the walkway and 10 ft / s with the walkway. What is the traveler's speed off the walkway? What is the speed of the moving walkway?

The traveler's speed off the walkway is _____ ft/s.

The speed of the moving walkway is _____ ft/s.

*41. If a plane can travel 490 miles per hour with the wind and 430 miles per hour against the wind, find the speed of the wind and the speed of the plane in still air.

What is the speed of the wind? _____ mph

What is the speed of the plane in still air? _____ mph

*42. Gabe Amodeo, a nuclear physicist, needs 30 liters of a 60% acid solution. He currently has a 40% solution and a 70% solution. How many liters of each does he need to make the needed 30 liters of 60% acid solution?

Gabe needs _____ liters of the 40% solution.

He also needs _____ liters of the 70% solution.

*43. Factor the expression.

$x^2 + 9x + 20$

$x^2 + 9x + 20 =$ _____

*44. Factor the trinomial completely.

$x^2 + 2x - 8$

$x^2 + 2x - 8 =$ _____

*45. The area of a rectangular rug is given by the trinomial $r^2 - 9r - 22$. What are the possible dimensions of the rug? Use factoring.

The length and the width of the rectangle are _____.
(Use a comma to separate answers as needed.)

*46. Complete the factoring.

$x^2 + 15x + 50$

$x^2 + 15x + 50 = (x + 5)($_____$)$

*47. Factor the expression.

$x^2 + 20x + 99$

$x^2 + 20x + 99 =$ _____

*48. Factor the expression.

$n^2 - 46n + 88$

$n^2 - 46n + 88 =$ _____

*49. Factor the expression.

$2y^2 + 5y + 3$

$2y^2 + 5y + 3 =$ _____
(Type your answer in factored form.)

*50. Factor.

$8x^2 - 10x - 3$

$8x^2 - 10x - 3 =$ _____

*51. Factor the expression.

$3x^2 + 13x + 4$

$3x^2 + 13x + 4 =$ _____
(Type your answer in factored form.)

*52. Factor the expression.

$2x^2 + 3x - 9$

$2x^2 + 3x - 9 =$ _____
(Type your answer in factored form.)

*53. Factor the expression.

$3x^2 + 11x - 4$

$3x^2 + 11x - 4 =$ _____
(Type your answer in factored form.)

*54. The area of a rectangular knitted blanket is $9x^2 - 6x - 8$. What are the possible dimensions of the blanket? Use factoring.

The possible dimensions of the blanket are _____.
(Use a comma to separate answers as needed.)

*55. Factor the expression completely.

$15x^2 - 35x - 30$

$15x^2 - 35x - 30 =$ _____

56. Solve the equation by factoring.

$x^2 - 1 = 0$

x = _____
(Use a comma to separate answers as needed.)

57. Solve the equation.

$q^2 + 2q - 3 = 0$

q = _____
(Use a comma to separate answers as needed.)

58. Solve the equation by factoring. Check your answer.

$x^2 - 16x = 0$

x = _____
(Use a comma to separate answers as needed.)

59. Solve the equation by factoring. Check your answer.

$2x^2 = 12x$

x = _____
(Use a comma to separate answers as needed.)

60. Classify the polynomial by degree and by number of terms.

$9x^3$

The polynomial is a (1) _____ (2) _____

(1)
- ○ linear
- ○ constant
- ○ cubic
- ○ quadratic

(2)
- ○ polynomial of four terms.
- ○ monomial.
- ○ binomial.
- ○ trinomial.

61. Write the polynomial in standard form. Then classify it by degree and by number of terms.

$8x^3 - 6 + 5x^2$

Write the polynomial in standard form. Choose the correct answer below.

- **A.** $8x^3 + 5x^2 - 6$
- **B.** $-6 + 5x^2 + 8x^3$
- **C.** $8x^3 - 6 + 5x^2$
- **D.** $-6 + 8x^3 + 5x^2$

Classify the polynomial.

The polynomial is a (1) _____ (2) _____.

(1)
- linear
- cubic
- constant
- quadratic

(2)
- trinomial
- binomial
- monomial
- polynomial of four terms

62. Write the polynomial in standard form. Then classify the polynomial by degree and by number of terms.

$9x^3 + 2x^3 - 7x^3$

Write the polynomial in standard form.

_____ (Simplify your answer.)

Classify the polynomial.

The polynomial is a (1) _____ (2) _____

(1)
- quartic
- cubic
- quadratic
- quintic

(2)
- polynomial of four terms.
- trinomial.
- binomial.
- monomial.

63. Solve.

$5a + 3b + c = 23$ (1)
$a - 3b + 2c = 10$ (2)
$14a - 2b + 3c = 85$ (3)

What is the solution? (_____, _____, _____)

64. Solve the equation using the Quadratic Formula.

$x^2 - 11x - 7 = 0$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** x = _____
  (Simplify your answer. Use integers or fractions for any numbers in the expression. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)
- **B.** There are no real solutions.

65. Find the discriminant of the quadratic equation. Determine the number of real solutions.

$x^2 - 14x + 49 = 0$

What is the discriminant of the quadratic equation?

_____

How many real solutions does the quadratic equation have?

- Two real solutions
- One real solution
- No real solutions

66. Solve the equation using the Quadratic Formula.

$x^2 - 10x + 21 = 0$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** x = _____
  (Simplify your answer. Use integers or fractions for any numbers in the expression. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)
- **B.** There are no real solutions.

67. Solve the equation using the Quadratic Formula.

$3x^2 - 17x = 6$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** x = _____
  (Simplify your answer. Use integers or fractions for any numbers in the expression. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)
- **B.** There are no real solutions.

68. Solve the equation using the Quadratic Formula.

$2x(x-1)=11$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** $x =$ _____
  (Simplify your answer. Use integers or fractions for any numbers in the expression. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)
- **B.** There are no real solutions.

69. Your class is selling boxes of flower seeds as a fundraiser. The total profit p depends on the amount x that your class charges for each box of seeds. The equation $p=-0.5x^2+36x-153$ models the profit of the fundraiser. What's the smallest amount, in dollars, that you can charge and make a profit of at least $459?

To make the desired profit, the smallest amount you can charge for each box is $ _____.
(Round to the nearest cent as needed.)

70. Evaluate the discriminant for the equation. Determine the number of real solutions.

$5x^2+8x+8=0$

What is the discriminant of the quadratic equation?

_____

How many real solutions does the quadratic equation have?

- Two real solutions
- No real solutions
- One real solution

1. 5

2. $-\frac{3}{4}$

3. $\frac{5}{3}$

4. 3

5. 5

6. $\frac{59}{110}$

7. Never true

8. $\frac{I}{PT}$

9. $\frac{r}{q+w}$

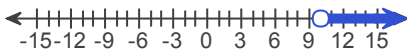
10. $\frac{7}{8}$

46

11. 4

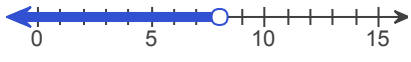
12. $\frac{Tr}{r-T}$

13. B. $a >$ **10**

G. 

14. (1) <

8

C. 

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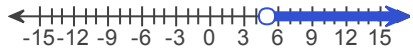
15. A. w > **5**

G. 

---

16. 139

---

17. A. The slope of the line is **1**. (Type an integer or a simplified fraction.)

---

18. A. The slope of the line is **0**. (Type an integer or a simplified fraction.)

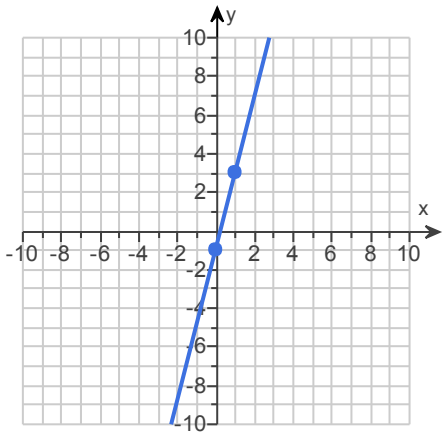
---

19. $-\frac{3}{5}x+\frac{12}{5}$

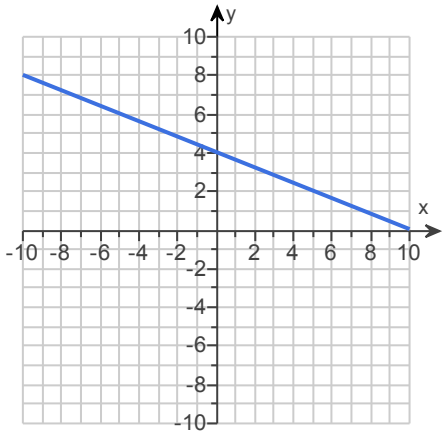
$-\frac{3}{5}$

$\left(0,\frac{12}{5}\right)$

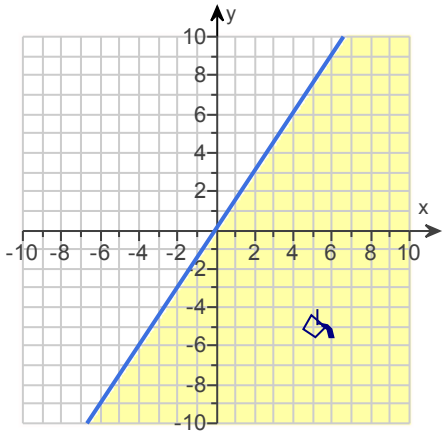
---

20. 

21.



22.

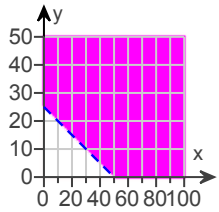


---

23. Yes

---

24. 60x + 120y > 3000



D.

---

25. A. The solution of the system is **(8, − 5)** .
(Simplify your answer. Type an ordered pair. Use integers or fractions for any numbers in the expression.)

---

26. A. The solution is **(2,6)** .(Type an ordered pair.)

---

27. A. The solution is **(6, − 1)** .
(Simplify your answer. Type an ordered pair. Use integers or fractions for any numbers in the expression.)

---

28. A. There is one solution. The solution is **(−8,4)**.
(Simplify your answer. Type an ordered pair. Use integers or fractions for any numbers in the expression.)

---

29. 6
9

---

30. A. **(−2,8)** (Type an ordered pair.)

---

31. A. **(7,1)** (Type an ordered pair.)

---

32. C. There is no solution.

---

33. A. The solution is $\left(\frac{44}{3}, -\frac{25}{12}\right)$.
(Simplify your answer. Type an ordered pair. Use integers or simplified fractions for any numbers in the expression.)

---

34. 7
14

---

35. 7
56

---

36. 20
30

---

37. 90

---

38. 700
400

---

39. (4, −2000)
B.
The ordered-pair solution to the system of equations is not viable for the situation, but there is a time when both strains have the same number of cells. After **3** hours, the two strains both have **0** cells.

---

40. 6
4

---

41. 30

460

---

42. 10

20

---

43. $(x + 5)(x + 4)$

---

44. $(x + 4)(x - 2)$

---

45. $r + 2, r - 11$

---

46. $x + 10$

---

47. $(x + 11)(x + 9)$

---

48. $(n - 2)(n - 44)$

---

49. $(y + 1)(2y + 3)$

---

50. $(2x - 3)(4x + 1)$

---

51. $(x + 4)(3x + 1)$

---

52. $(x + 3)(2x - 3)$

---

53. $(x + 4)(3x - 1)$

---

54. $3x - 4, 3x + 2$

---

55. $5(x - 3)(3x + 2)$

---

56. $-1, 1$

---

57. $-3, 1$

---

58. 0, 16

---

59. 0,6

---

60. (1) cubic

(2) monomial.

---

61. A. $8x^3 + 5x^2 - 6$

(1) cubic

(2) trinomial

---

62. $4x^3$

(1) cubic

(2) monomial.

---

63. 6

-2

-1

---

64. A. $x = \dfrac{11 + \sqrt{149}}{2}, \dfrac{11 - \sqrt{149}}{2}$

(Simplify your answer. Use integers or fractions for any numbers in the expression. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

---

65. 0

One real solution

---

66. A. $x =$ **3,7**

(Simplify your answer. Use integers or fractions for any numbers in the expression. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

---

67. A. $x =$ $\mathbf{6, -\dfrac{1}{3}}$

(Simplify your answer. Use integers or fractions for any numbers in the expression. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

---

68. A. $x = \frac{1-\sqrt{23}}{2}, \frac{1+\sqrt{23}}{2}$

(Simplify your answer. Use integers or fractions for any numbers in the expression. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

---

69. 27.51

---

70. − 96

No real solutions
