

Student: _____

Date: _____

Instructor: CHRISTOPHER FOLEY

Course: MAC1105 COLL ALGEBRA T R

8:00 AM 9:15 AM CHRISTOPHER

FOLEY 565314

Assignment: Final Exam Study Guide

1. Multiply.

$$\frac{x^2 - 9}{x^2} \cdot \frac{x^2 - 3x}{x^2 + 2x - 15}$$

Select the correct choice below and fill in any answer boxes within your choice.

☐ A. $\frac{x^2 - 9}{x^2} \cdot \frac{x^2 - 3x}{x^2 + 2x - 15} =$ _____, $x \neq$ _____

(Simplify your answer. Use a comma to separate answers as needed.)

☐ B. $\frac{x^2 - 9}{x^2} \cdot \frac{x^2 - 3x}{x^2 + 2x - 15} =$ _____, no numbers must be excluded.

2. Multiply the expressions.

$$\frac{x^2 - 6x + 5}{x^2 - x - 20} \cdot \frac{x^2 - 16}{x^2 - 1}$$

Select the correct choice below and fill in the answer box(es) within your choice.

☐ A. $\frac{x^2 - 6x + 5}{x^2 - x - 20} \cdot \frac{x^2 - 16}{x^2 - 1} =$ _____, $x \neq$ _____

(Simplify your answer. Use a comma to separate answers as needed.)

☐ B. $\frac{x^2 - 6x + 5}{x^2 - x - 20} \cdot \frac{x^2 - 16}{x^2 - 1} =$ _____ and no numbers must be excluded.

3. Find the following product and write the result in standard form,
- $a + bi$
- .

$$(-6 + 2i)(1 + i)$$

$$(-6 + 2i)(1 + i) =$$

4. Find the product.

$$(6 - 4i)(8 - 2i)$$

$$(6 - 4i)(8 - 2i) =$$

(Simplify your answer. Type your answer in the form $a + bi$.)

5. Solve the equation by factoring.

$$14x^2 + 3x - 2 = 0$$

The solution set is {_____}.

6. Use factoring to solve the quadratic equation. Check by substitution or by using a graphing utility and identifying x-intercepts.

$$5x^2 = 27x + 56$$

The solution set is {_____}.

(Use commas to separate answers as needed. Type repeated roots only once.)

7. Determine the constant that should be added to the binomial so that it becomes a perfect square trinomial. Then write and factor the trinomial.

$$x^2 + 13x$$

What is the constant that should be added to the binomial so that it becomes a perfect square trinomial?

(Type an integer or a simplified fraction.)

Write the trinomial.

(Do not factor. Use integers or fractions for any numbers in the expression.)

Factor the result.

(Type your answer in factored form. Use integers or fractions for any numbers in the expression.)

8. Solve the equation using any method.

$$4x^2 + 6 = 25x$$

The solution set is {_____}.

(Simplify your answer. Type an exact answer, using radicals and i as needed. Use a comma to separate answers as needed.)

9. Solve the following equation.

$$4x^2 - 32x + 64 = 0$$

The solution set is {_____}.

(Use a comma to separate answers as needed.)

10. Find the real solutions of the equation.

$$\sqrt{4 - 3x} = x$$

What is the solution set? Select the correct choice below and fill in any answer boxes in your choice.

☐ A. {_____}

(Simplify your answer. Use a comma to separate answers as needed.)

☐ B. There are no real solutions.

11. Solve the following equation by making an appropriate substitution.

$$x - 17\sqrt{x} + 70 = 0$$

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

- ☐ A. The solution set is $\{\rule{1cm}{0.4pt}\}$. (Use a comma to separate answers as needed.)
- ☐ B. The solution set is the empty set.

12. Find the solution(s) of the equation.

$$|2x - 3| = 11$$

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

- ☐ A. The solution set is $\{\rule{1cm}{0.4pt}\}$.
(Use a comma to separate answers as needed.)
- ☐ B. There is no solution.

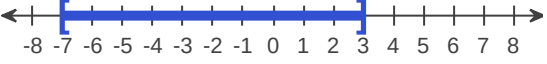

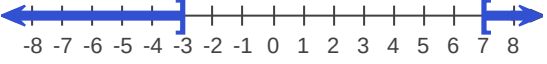
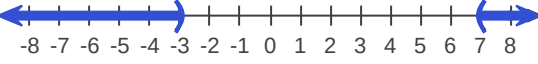
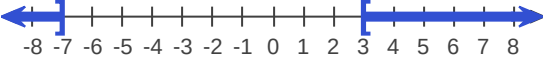
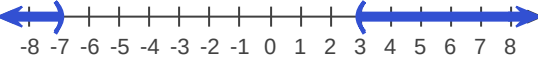

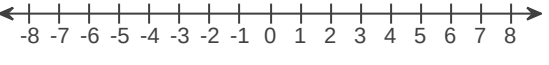
13. Solve the polynomial inequality and graph the solution set on a real number line. Express the solution set in interval notation.

$$(x - 3)(x + 7) \leq 0$$

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

- ☐ A. The solution set is $\rule{1cm}{0.4pt}$.
(Type your answer in interval notation. Use integers or fractions for any numbers in the expression.)
- ☐ B. The solution set is the empty set.

Which number line below shows the graph of the solution set?

- ☐ A. 
- ☐ B. 
- ☐ C. 
- ☐ D. 
- ☐ E. 
- ☐ F. 
- ☐ G. 
- ☐ H. 

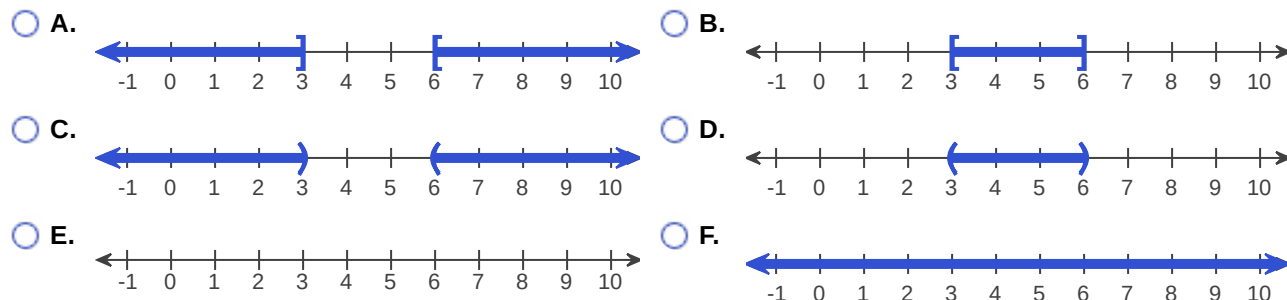
14. Solve the polynomial inequality and graph the solution set on a real number line. Express the solution set in interval notation.

$$x^2 - 9x + 18 > 0$$

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

- ☐ A. The solution set is _____.
(Type your answer in interval notation. Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression.)
- ☐ B. The solution set is the empty set.

Choose the correct graph below.



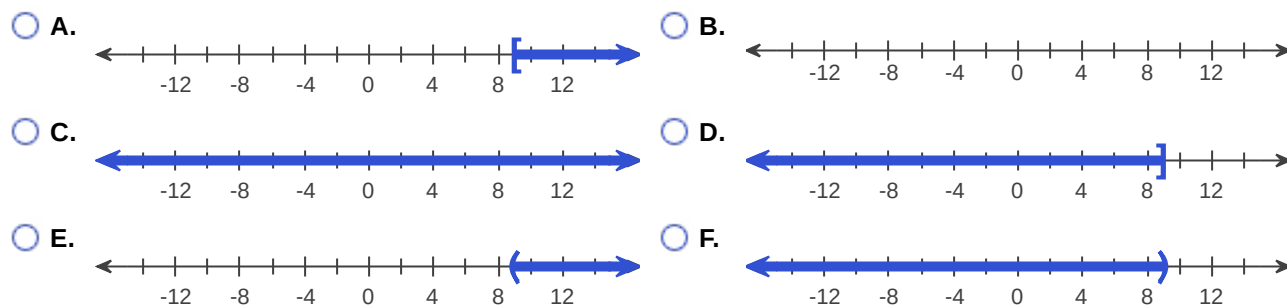
15. Solve the polynomial inequality and graph the solution set on a real number line. Express the solution set in interval notation.

$$x^2 - 18x + 81 < 0$$

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

- ☐ A. The solution set is _____.
(Type your answer in interval notation. Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression.)
- ☐ B. The solution set is the empty set.

Choose the correct graph below.



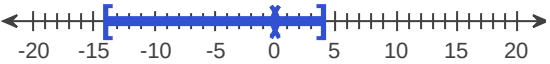


16. Solve the inequality, then graph the solution set.

$$|x + 5| \leq 9$$

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

- ☐ A. The solution set is _____. (Type your answer in interval notation.)
- ☐ B. The solution set is \emptyset .

Choose the correct graph below.

- ☐ A. 
- ☐ B. 
- ☐ C. 
- ☐ D. The graph contains no points.

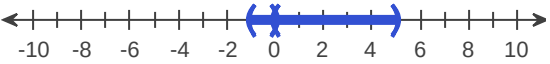
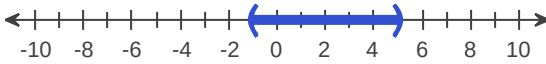
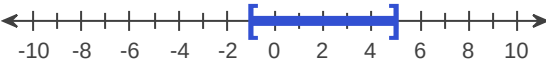
17. Solve the inequality, then graph the solution set.

$$|3x - 6| < 9$$

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

- ☐ A. The solution set is _____. (Type your answer in interval notation.)
- ☐ B. The solution set is \emptyset .

Choose the correct graph below.

- ☐ A. 
- ☐ B. 
- ☐ C. 
- ☐ D. The graph contains no points.

18. Solve the absolute value inequality.

$$|x - 1| \geq 7$$

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

- ☐ A. The solution set in interval notation is _____.
- ☐ B. The solution set is \emptyset .

19. Solve the absolute value inequality.

$$|3x - 9| > 15$$

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

- ☐ A. The solution set is _____. (Type your answer in interval notation.)
- ☐ B. The solution set is the empty set.

20. Find the distance between the pair of points.

$$(-6, 1) \text{ and } (-10, 9)$$

The distance is _____.

(Type an exact answer, using radicals as needed. Simplify your answer.)

21. Find the distance between the two given points.

$$(-6, -3) \text{ and } (-4, 3)$$

The distance between the two points is _____.

(Type an exact answer, using radicals as needed.)

22. Find the midpoint of the line segment with the given endpoints.

$$(4, 2) \text{ and } (10, 6)$$

The midpoint of the segment is _____.

(Type an ordered pair.)

23. Find the midpoint of the line segment with the given endpoints.

$$(-8, -7) \text{ and } (-7, -2)$$

The midpoint is _____. (Type an ordered pair.)

24. Find the midpoint of the line segment whose endpoints are given.

$$(-5, 9), (9, -1)$$

The midpoint is _____.

(Simplify your answer.)

25. Determine if the function is even, odd, or neither.

$$f(x) = x^5 + x^3$$

The function f is:

- ☐ A. neither
- ☐ B. even
- ☐ C. odd

26. Determine if the function is even, odd, or neither.

$$g(x) = x^6 + x^5$$

The function g is:

- ☐ A. even
☐ B. odd
☐ C. neither

27. Determine if the function is even, odd, or neither.

$$h(x) = x^4 - x^{12}$$

The function h is:

- ☐ A. even
☐ B. odd
☐ C. neither

28. Determine if the function is even, odd, or neither.

$$f(x) = x^4 - x^{12} + 1$$

The function f is:

- ☐ A. neither
☐ B. even
☐ C. odd

29. Determine if the function is even, odd, or neither.

$$f(x) = \frac{1}{4}x^8 - 4x^2$$

The function f is:

- ☐ A. even
☐ B. neither
☐ C. odd

30. Write the standard form of the equation of the circle with the given center and radius.

Center $(-6, -8)$, $r = 10$

Type the standard form of the equation of the circle.

_____ (Simplify your answer.)

31. Write the standard form of the equation of the circle with the given center and radius.

Center $(-2, -5)$, $r = \sqrt{6}$

The equation of the circle in standard form is _____.
(Simplify your answer.)

32. Evaluate the function $f(x) = x^2 + 8x + 1$ at the given values of the independent variable and simplify.

a. $f(-9)$ b. $f(x+1)$ c. $f(-x)$

a. $f(-9) =$ _____ (Simplify your answer.)

b. $f(x+1) =$ _____ (Simplify your answer.)

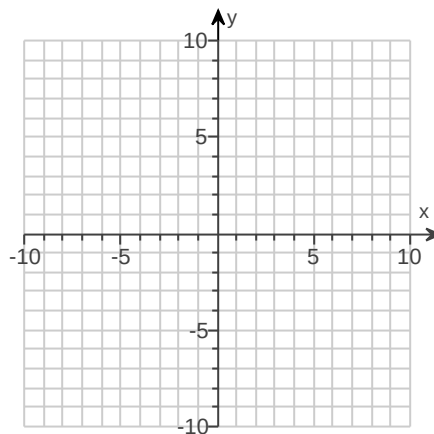
c. $f(-x) =$ _____ (Simplify your answer.)

- 33.

Use transformations of the graph of $f(x) = x^2$ to determine the graph of the given function.

$$g(x) = (x + 5)^2$$

Use the graphing tool to graph the function.

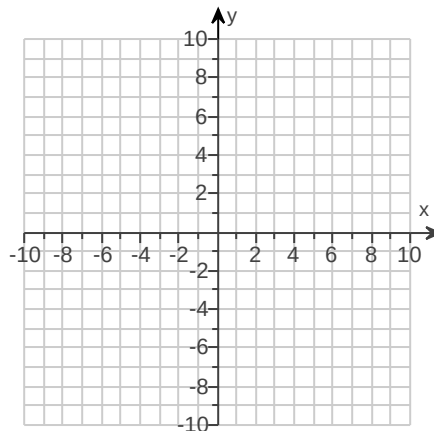


- 34.

Use transformations of $f(x) = x^2$ to graph the following function.

$$g(x) = (x - 6)^2 - 4$$

Use the graphing tool to graph the function.



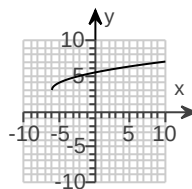
35.

Use transformations of $f(x) = \sqrt{x}$ to graph the following function.

$$h(x) = \sqrt{x-3} + 6$$

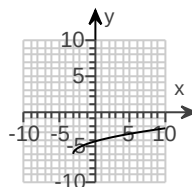
Choose the correct graph below.

☐ A.



☐ E.

☐ C.



☐ I.

36. Begin by graphing the absolute value function, $f(x) = |x|$. Then use transformations of this graph to graph the given function.

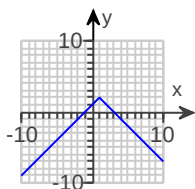
$$g(x) = -|x+2| - 1$$

What transformations are needed in order to obtain the graph of $g(x)$ from the graph of $f(x)$? Select all that apply.

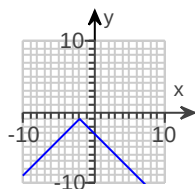
- ☐ A. Horizontal translation
☐ B. Reflection about the x-axis
☐ C. Reflection about the y-axis
☐ D. Vertical stretch/shrink
☐ E. Vertical translation
☐ F. Horizontal stretch/shrink

Choose the correct graph of $g(x)$ below.

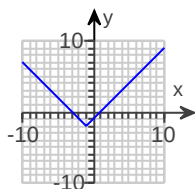
☐ A.



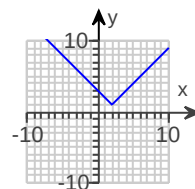
☐ B.



☐ C.



☐ D.



37. For $f(x) = x + 5$ and $g(x) = 3x + 3$, find the following functions.

a. $(f \circ g)(x)$; **b.** $(g \circ f)(x)$; **c.** $(f \circ g)(0)$; **d.** $(g \circ f)(0)$

a. $(f \circ g)(x) =$ _____ (Simplify your answer.)

b. $(g \circ f)(x) =$ _____ (Simplify your answer.)

c. $(f \circ g)(0) =$ _____

d. $(g \circ f)(0) =$ _____

38. For $f(x) = 2x - 3$ and $g(x) = x^2 - 3$, find the following functions.

a. $(f \circ g)(x)$; **b.** $(g \circ f)(x)$; **c.** $(f \circ g)(-2)$; **d.** $(g \circ f)(-2)$

a. $(f \circ g)(x) =$ _____ (Simplify your answer.)

b. $(g \circ f)(x) =$ _____ (Simplify your answer.)

c. $(f \circ g)(-2) =$ _____ (Simplify your answer.)

d. $(g \circ f)(-2) =$ _____ (Simplify your answer.)

39. Given the function $f(x) = \sqrt{x-1}$,

(a) Find $f^{-1}(x)$.

(b) Graph f and f^{-1} in the same rectangular coordinate system.

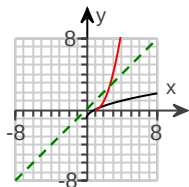
(c) Use interval notation to give the domain and the range of f and f^{-1} .

(a) Find $f^{-1}(x)$.

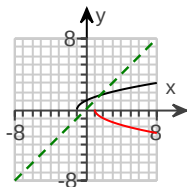
$f^{-1}(x) =$ _____ ; $x \geq$ _____

b) Choose the correct graph which shows f and f^{-1} graphed in the same coordinate system.

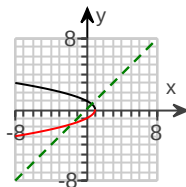
☐ **A.**



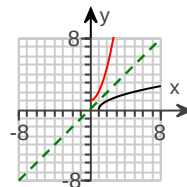
☐ **B.**



☐ **C.**



☐ **D.**



(c) State the domain and range of f and f^{-1} using interval notation.

Domain of f = Range of $f^{-1} =$ _____

Range of f = Domain of $f^{-1} =$ _____

40. In the following exercise, find the coordinates of the vertex for the parabola defined by the given quadratic function.

$$f(x) = 2(x - 3)^2 + 1$$

The vertex is _____. (Type an ordered pair.)

41. In the following exercise, find the coordinates of the vertex for the parabola defined by the given quadratic function.

$$f(x) = -2(x + 3)^2 + 2$$

The vertex is _____. (Type an ordered pair.)

42. In the following exercise, find the coordinates of the vertex for the parabola defined by the given quadratic function.

$$f(x) = 3x^2 + 18x + 1$$

The vertex is _____. (Type an ordered pair.)

43. Find the coordinates of the vertex for the parabola defined by the given quadratic function.

$$f(x) = -x^2 - 8x + 8$$

The vertex is _____. (Type an ordered pair.)

44.

Use the vertex and intercepts to sketch the graph of the quadratic function. Give the equation of the parabola's axis of symmetry. Use the graph to determine the domain and range of the function.

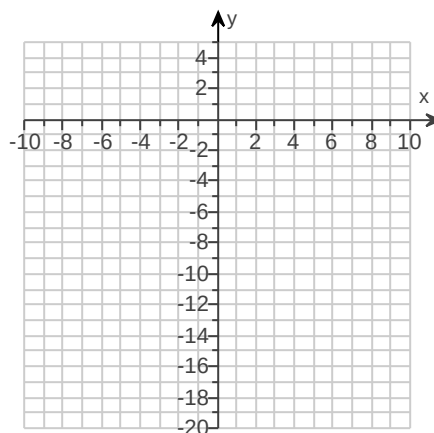
$$f(x) = 8x - x^2 - 17$$

Use the graphing tool to graph the equation. Use the vertex and one of the intercepts when drawing the graph.

The axis of symmetry is _____.
(Type an equation.)

The domain is _____.
(Type your answer in interval notation.)

The range is _____.
(Type your answer in interval notation.)



45. Consider the function $f(x) = -2x^2 + 8x - 4$.

- Determine, without graphing, whether the function has a minimum value or a maximum value.
 - Find the minimum or maximum value and determine where it occurs.
 - Identify the function's domain and its range.
-

a. The function has a (1) _____ value.

b. The minimum/maximum value is _____. It occurs at $x =$ _____.

c. The domain of f is _____. (Type your answer in interval notation.)

The range of f is _____. (Type your answer in interval notation.)

- (1) ☐ maximum
☐ minimum
-

46. Evaluate the expression without using a calculator.

$$\log_2 8$$

$$\log_2 8 = \underline{\hspace{2cm}}$$

47. Evaluate the expression without using a calculator.

$$\log_{10} \frac{1}{10}$$

$$\log_{10} \frac{1}{10} = \underline{\hspace{2cm}}$$

48. Solve for x .

$$7^{3x-1} = 49$$

The solution set is $\{\underline{\hspace{2cm}}\}$.

49. Solve the following exponential equation by expressing each side as a power of the same base and then equating exponents.

$$5^{4x-1} = 125$$

The solution set is $\{\underline{\hspace{2cm}}\}$.

50.

Use the compound interest formulas $A = P \left(1 + \frac{r}{n} \right)^{nt}$ and $A = Pe^{rt}$ to solve the problem given. Round answers to the nearest cent.

Find the accumulated value of an investment of \$15,000 for 4 years at an interest rate of 4.5% if the money is **a.** compounded semiannually; **b.** compounded quarterly; **c.** compounded monthly **d.** compounded continuously.

a. What is the accumulated value if the money is compounded semiannually?

\$ _____ (Round your answer to the nearest cent.)

b. What is the accumulated value if the money is compounded quarterly?

\$ _____ (Round your answer to the nearest cent.)

c. What is the accumulated value if the money is compounded monthly?

\$ _____ (Round your answer to the nearest cent.)

d. What is the accumulated value if the money is compounded continuously?

\$ _____ (Round your answer to the nearest cent.)

51. Write the equation in its equivalent exponential form.

$$3 = \log_9 729$$

What is the equivalent exponential form of the equation?

52. Write the equation in its equivalent exponential form.

$$4 = \log_5 M$$

What is the equivalent exponential form of the equation?

53. Write the following equation in its equivalent exponential form.

$$\log_5 25 = y$$

The exponential form is _____ .
(Type an equation.)

54. Fill in the blank.

$$\log_b b = \underline{\hspace{2cm}}$$

$$\log_b b = (1) \underline{\hspace{2cm}}$$

- (1) ☐ 1
☐ 0
☐ x
☐ b
-

55. Fill in the blank so that the resulting statement is true.

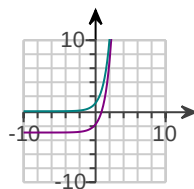
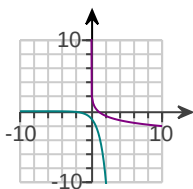
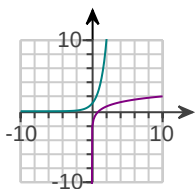
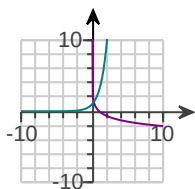
$$\log_b b^x = \underline{\hspace{2cm}} \text{ (Simplify your answer.)}$$

56. Fill in the blank.

$$b^{\log_b x} = \underline{\hspace{2cm}}$$

$$b^{\log_b x} = (1) \underline{\hspace{2cm}}$$

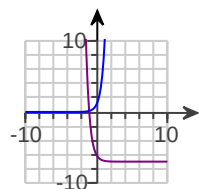
- (1) ☐ 1
☐ x
☐ b
☐ 0
-

57. Graph $f(x) = 3^x$ and $g(x) = \log_3 x$ in the same rectangular coordinate system.

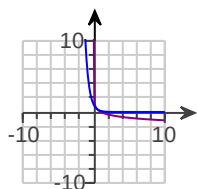
58. Graph $f(x) = \left(\frac{1}{7}\right)^x$ and $g(x) = \log_{1/7} x$ in the same rectangular coordinate system.

Choose the correct graph below.

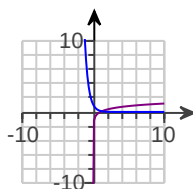
☐ A.



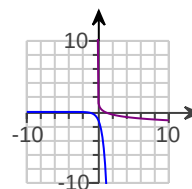
☐ B.



☐ C.



☐ D.



59. Use properties of logarithms to condense the logarithmic expression below. Write the expression as a single logarithm whose coefficient is 1. Where possible, evaluate logarithmic expressions.

$$2 \ln x + 4 \ln y - 6 \ln z$$

$$2 \ln x + 4 \ln y - 6 \ln z = \underline{\hspace{2cm}}$$

60. Use properties of logarithms to condense the logarithmic expression. Write the expression as a single logarithm whose coefficient is 1. Where possible, evaluate logarithmic expressions.

$$\log x + \log (x^2 - 25) - \log 7 - \log (x + 5)$$

$$\log x + \log (x^2 - 25) - \log 7 - \log (x + 5) = \underline{\hspace{2cm}}$$

(Simplify your answer.)

61. Use common logarithms or natural logarithms and a calculator to evaluate the expression.

$$\log_{14} 13$$

$$\log_{14} 13 \approx \underline{\hspace{2cm}} \quad (\text{Round to four decimal places.})$$

62. Solve the following exponential equation. Express the solution set in terms of natural logarithms. Then use a calculator to obtain a decimal approximation, correct to two decimal places, for the solution.

$$2^x = 3$$

What is the solution in terms of natural logarithms?

The solution set is $\{\underline{\hspace{2cm}}\}$.

(Use a comma to separate answers as needed. Simplify your answer. Use integers or fractions for any numbers in the expression.)

What is the decimal approximation for the solution?

The solution set is $\{\underline{\hspace{2cm}}\}$.

(Use a comma to separate answers as needed. Round to two decimal places as needed.)

63. Solve the exponential equation. Express the solution in terms of natural logarithms. Then use a calculator to obtain a decimal approximation for the solution.

$$6^{(x-3)} = 275$$

What is the solution in terms of natural logarithms?

The solution set is $\{\rule{1.5cm}{0.4pt}\}$.

(Use a comma to separate answers as needed. Simplify your answer. Use integers or fractions for any numbers in the expression.)

What is the decimal approximation for the solution?

The solution set is $\{\rule{1.5cm}{0.4pt}\}$.

(Use a comma to separate answers as needed. Round to two decimal places as needed.)

64. Solve the logarithmic equation. Be sure to reject any value of x that is not in the domain of the original logarithmic expressions. Give the exact answer.

$$\log_5(x+2) + \log_5(x+22) = 3$$

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

- ☐ A. The solution set is $\{\rule{1.5cm}{0.4pt}\}$.
(Simplify your answer. Use a comma to separate answers as needed.)
- ☐ B. There is no solution.
-

65. Solve the given system by the substitution method.

$$5x + 3y = 0$$

$$x - 2y = 0$$

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

- ☐ A. The solution set is $\{\rule{1.5cm}{0.4pt}\}$. (Type an ordered pair.)
- ☐ B. There are infinitely many solutions.
- ☐ C. There is no solution.
-

66. Solve the system by the substitution method.

$$6x + 7y = -28$$

$$5x - y = 4$$

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

- ☐ A. The solution set is $\{\rule{1.5cm}{0.4pt}\}$. (Type an ordered pair.)
- ☐ B. There are infinitely many solutions.
- ☐ C. There is no solution.
-

67. Solve the system by the addition method.

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

Select the correct choice below and fill in any answer boxes present in your choice.

- ☐ A. The solution set is $\{ \quad \}$. (Simplify your answer. Type an ordered pair.)
- ☐ B. There are infinitely many solutions.
- ☐ C. There is no solution.

68. Solve the given system of equations.

$$\begin{aligned}x + y + 8z &= -16 \\ x + y + 2z &= -4 \\ x - 2y + 9z &= -30\end{aligned}$$

Select the correct choice below and fill in any answer boxes within your choice.

- ☐ A. There is one solution. The solution set is $\{ (\quad , \quad , \quad) \}$. (Simplify your answers.)
- ☐ B. There are infinitely many solutions.
- ☐ C. There is no solution.

69. Solve the system. If there is no solution or if there are infinitely many solutions and the system's equations are dependent, so state.

$$\begin{aligned}6x - y + 3z &= 12 \\ x + 3y - z &= -6 \\ 3x + 3y - 4z &= 1\end{aligned}$$

Select the correct choice below and fill in any answer boxes within your choice.

- ☐ A. There is one solution. The solution set is $\{ (\quad , \quad , \quad) \}$. (Simplify your answers.)
- ☐ B. There are infinitely many solutions.
- ☐ C. There is no solution.

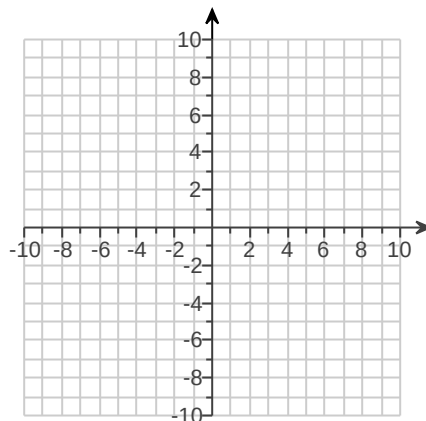
70.

Graph the solution set of the following system of inequalities.

$$2x + 4y \leq 4$$

$$4x + y \leq 8$$

Use the graphing tool to graph the system of inequalities.



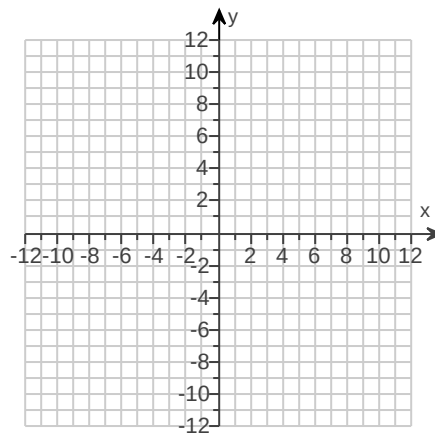
71.

Graph the solution set of the system of inequalities.

$$2x - 3y \leq 6$$

$$2x - 2y > 4$$

Use the graphing tool to graph the system.



1. A. $\frac{x^2 - 9}{x^2} \cdot \frac{x^2 - 3x}{x^2 + 2x - 15} = \frac{(x+3)(x-3)}{x(x+5)}$, $x \neq$ -5,0,3

(Simplify your answer. Use a comma to separate answers as needed.)

2. A. $\frac{x^2 - 6x + 5}{x^2 - x - 20} \cdot \frac{x^2 - 16}{x^2 - 1} = \frac{x-4}{x+1}$, $x \neq$ -4,5,1,-1

(Simplify your answer. Use a comma to separate answers as needed.)

3. $-8 + (-4i)$

4. $40 - 44i$

5. $\frac{2}{7}, -\frac{1}{2}$

6. $-\frac{8}{5}, 7$

7. $\frac{169}{4}$

$$x^2 + 13x + \frac{169}{4}$$

$$\left(x + \frac{13}{2}\right)^2$$

8. $6, \frac{1}{4}$

9. 4

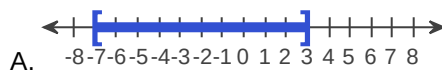
10. A. $\{ \underline{1} \}$ (Simplify your answer. Use a comma to separate answers as needed.)

11. A. The solution set is $\{ \underline{100,49} \}$. (Use a comma to separate answers as needed.)

12. A. The solution set is $\{ \underline{-4,7} \}$. (Use a comma to separate answers as needed.)

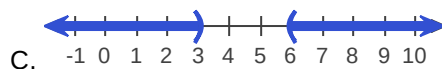
13. A. The solution set is $[-7, 3]$.

(Type your answer in interval notation. Use integers or fractions for any numbers in the expression.)

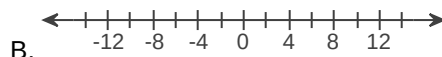


14. A. The solution set is $(-\infty, 3) \cup (6, \infty)$.

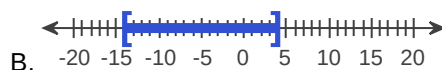
(Type your answer in interval notation. Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression.)



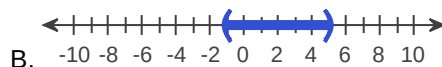
15. B. The solution set is the empty set.



16. A. The solution set is $[-14, 4]$. (Type your answer in interval notation.)



17. A. The solution set is $(-1, 5)$. (Type your answer in interval notation.)



18. A. The solution set in interval notation is $(-\infty, -6] \cup [8, \infty)$.

19. A. The solution set is $(-\infty, -2) \cup (8, \infty)$. (Type your answer in interval notation.)

20. $4\sqrt{5}$

21. $2\sqrt{10}$

22. $(7, 4)$

23. $(-7.5, -4.5)$

24. (2,4)

25. C. odd

26. C. neither

27. A. even

28. B. even

29. A. even

30. $(x+6)^2 + (y+8)^2 = 100$

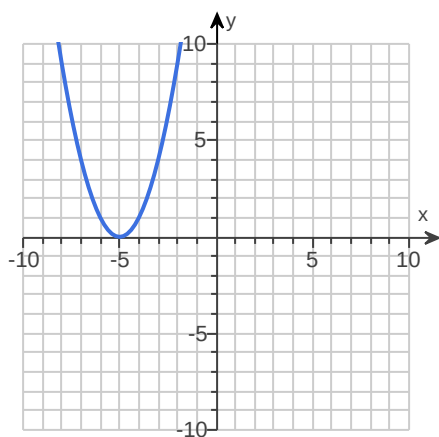
31. $(x+2)^2 + (y+5)^2 = 6$

32. 10

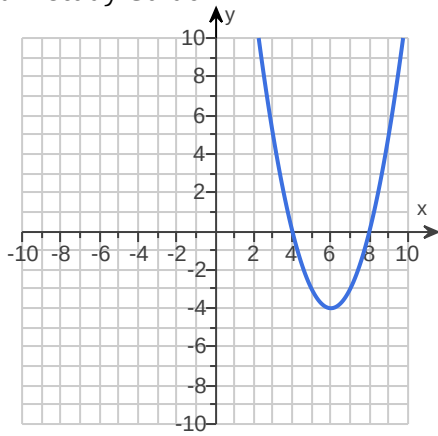
$$x^2 + 10x + 10$$

$$x^2 - 8x + 1$$

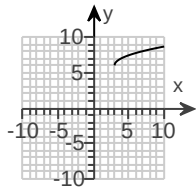
33.



34.

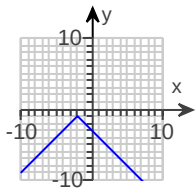


35.



D.

36. A. Horizontal translation, B. Reflection about the x-axis, E. Vertical translation



B.

37. $3x + 8$

$3x + 18$

8

18

38. $2x^2 - 9$

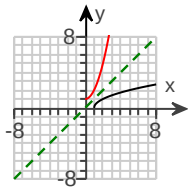
$4x^2 - 12x + 6$

-1

46

39. $x^2 + 1$

0



D.

$[1, \infty)$

$[0, \infty)$

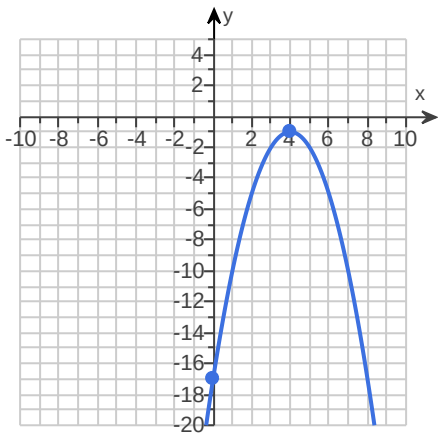
40. $(3,1)$

41. $(-3,2)$

42. $(-3,-26)$

43. $(-4,24)$

44.



$x = 4$

$(-\infty, \infty)$

$(-\infty, -1]$

45. (1) maximum

4

2

$(-\infty, \infty)$

$(-\infty, 4]$

47. -1

48. 1

49. 1

50. $17,922.47$
 $17,940.22$
 $17,952.22$
 $17,958.26$

51. $9^3 = 729$

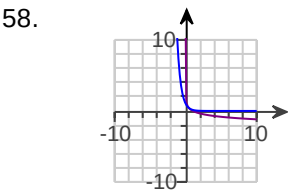
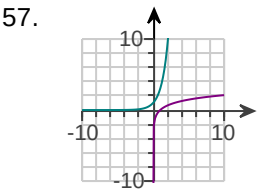
52. $5^4 = M$

53. $5^y = 25$

54. $(1) 1$

55. x

56. $(1) x$



B.

59. $\ln \left(\frac{x^2 y^4}{z^6} \right)$

60. $\log \left| \frac{x(x-5)}{7} \right|$

61. 0.9719

62. $\frac{\ln 3}{\ln 2}$
1.58

63. $\frac{\ln 275}{\ln 6} + 3$
6.13

64. A. The solution set is $\{ \underline{\mathbf{3}} \}$. (Simplify your answer. Use a comma to separate answers as needed.)

65. A. The solution set is $\{ \underline{\mathbf{(0,0)}} \}$. (Type an ordered pair.)

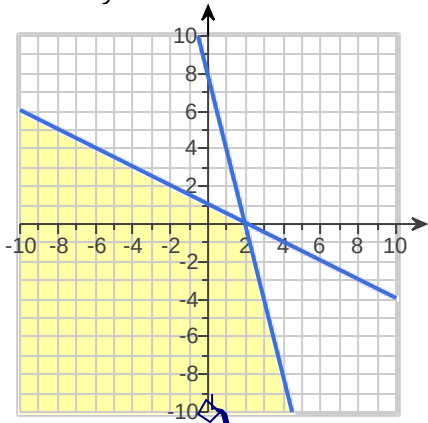
66. A. The solution set is $\{ \underline{\mathbf{(0, -4)}} \}$. (Type an ordered pair.)

67. A. The solution set is $\{ \underline{\mathbf{(3, -2)}} \}$. (Simplify your answer. Type an ordered pair.)

68. A.
There is one solution. The solution set is $\{ (\underline{\mathbf{-4}}, \underline{\mathbf{4}}, \underline{\mathbf{-2}}) \}$. (Simplify your answers.)

69. A. There is one solution. The solution set is $\{ (\underline{\mathbf{2}}, \underline{\mathbf{-3}}, \underline{\mathbf{-1}}) \}$.
(Simplify your answers.)

70.



71.

