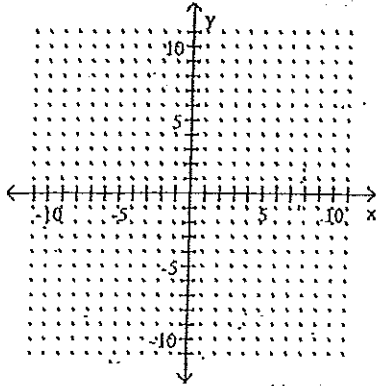


MATH085 Final Exam

1. Determine the slope and y- intercept. Use the slope and y-intercept to graph the equation.

Draw your graph in the space below

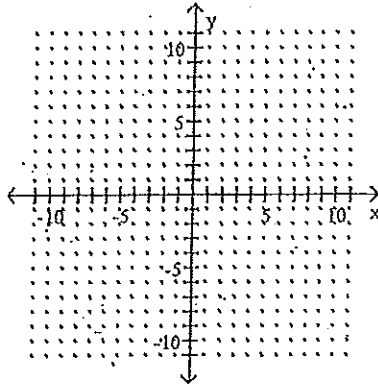
$$3x - 2y - 12 = 0$$



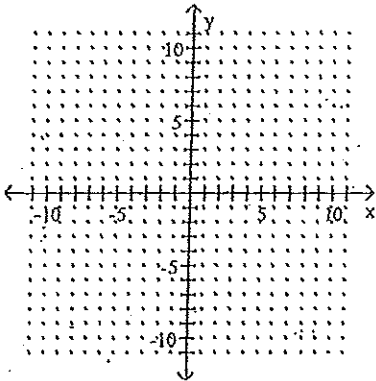
2. Determine the slope and y- intercept. Use the slope and y-intercept to graph the equation.

Draw your graph in the space below

$$7x + 2y + 3 = 5x - 3y + 13$$

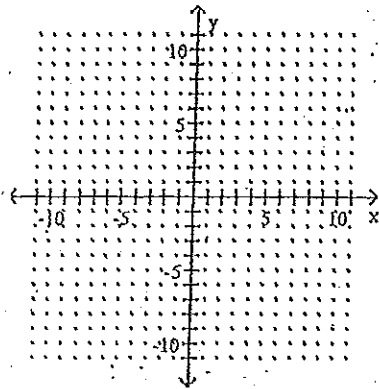


3. Find the x-intercept and the y-intercept and graph using intercepts. $7x - 3y = 21$



4. Find the x-intercept and the y-intercept and graph.

$$5x - 10y = 0$$



5. Evaluate the function at the given value of x.

$$f(x) = 3x + 2, f(b-3)$$

6. For the given function, find the value of x that corresponds to the given value of f(x). $f(x) = 5x - 3$, $f(x) = 7$

7. Find the x-intercept and y-intercept of the function $f(x) = 4x - 3$

8. Find an equation of a line that has the given slope and contains the given point. $m = 3$, $(4, 7)$

9. Find an equation of the line that passes through the two given points $(2, 5)$ and $(-3, -7)$

Solve each system and graph.

10. $8 \leq 2x + 2 \leq 12$

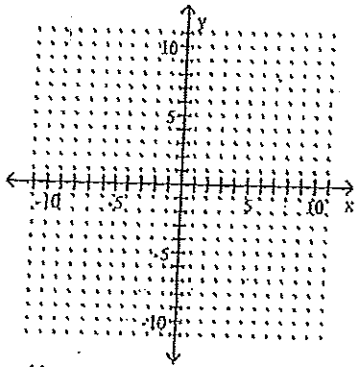
10 _____

11. $3 \geq \frac{1}{4}x + 5 \geq 7$

11 _____

12. Solve the following systems of equations graphically. $Y = \frac{4}{3}X - 5$

$$Y = -3X + 4$$



13. Let $M(t) = 17.37t + 392.19$ be the numbers of morning newspapers sold and $E(t) = -30.06t + 1372.16$, both at t years since 2000. Estimate when the numbers are equal and what the numbers are.

13 _____

14. Solve the systems of equations by substitution:

$$Y = 5(X - 1)$$

$$Y = 2(X + 2)$$

14 _____

15. Solve the systems of equations by substitution

$$Y = -0.51X - 2.64$$

$$Y = -2.79X + 5.94$$

15 _____

16. Solve by elimination

$$6X + 5Y = -14$$

$$-4X - 7Y = 2$$

16 _____

17. Solve by elimination

$$\frac{1}{4}X + \frac{5}{2}Y = 2$$

$$\frac{5}{6}X - \frac{1}{3}Y = -2$$

17 _____

18. A person plans to invest a total of \$3500 in a bank certificate at 3% interest and a small cap account at 16% interest. How much should she invest so that the total interest in one year will be \$200?

18 _____

19. A chemist wants to mix a 30% acid solution and a 50% acid solution to make a 42% acid solution. How many quarts of each must be mixed to make 10 quarts of 42% solution?

19 _____

20. An auditorium has 450 balcony seats and 1700 main level seats. If tickets for balcony seats are priced at 15 dollars less than main level seats, what should the prices be for each type of ticket for total revenues for a sellout performance to be \$100,750?

20 _____

21. The length of a golden rectangle is equal to about 1.62 times the width. An architect wants to design a room so that the floor is a golden rectangle with a perimeter of 50 feet. What are the dimensions of the floor?

21 _____

Complete the indicated polynomial operation and simplify where possible

22. $(6X^6 + 3X^4 - 7X^2 - 5) + (2X^6 - 5X^5 + 2X^4 - 4X^2 + 8)$

22 _____

23. $T^5 - 7TY + Y^4) - (2T^5 - 4TY - 6Y^4)$

23 _____

24. $4X^3(7X^5 - 2X^4 - 5X^3)$

24 _____

25. $(2A - B)^2$

25 _____

26. $(4X - 3Y)(7X + 2Y)$

26 _____

27. $(2X - 5)(2X^2 + 7X - 3)$

27 _____

28. Find the requested product $f(x) = x + 2$, $g(x) = X^2 + 3X - 5$ FIND $(f \cdot g)(x)$ and $(f \cdot g)(3)$

28. _____

28. _____

29. Simplify $\frac{(27A^5B^{-3})}{(-9A^2B^{-6})}$

29. _____

30. Simplify $\left(\frac{3A^5B^{-3}}{C^{-5}}\right)^4$

30. _____

Simplify

31. $\left(\frac{16T^{-2}S^3}{32T^{-5}S^{-3}}\right)^{-6} =$

31. _____

32. $\frac{X^{(8A-5)}}{X^{(2A-8)}} =$

32. _____

$$33. \frac{A^{-\frac{3}{5}} B^{\frac{2}{7}}}{(A^6 B^{-9})^{\frac{2}{3}}} =$$

33. _____

$$34. \frac{(27X^{-9}Y^{15})^{\frac{2}{3}}}{(64X^{-3}Y^6)^{\frac{5}{3}}} =$$

34. _____

Find an exponential equation $y = ab^x$ given two points

35. (0, 3) and (2, 27)

35. _____

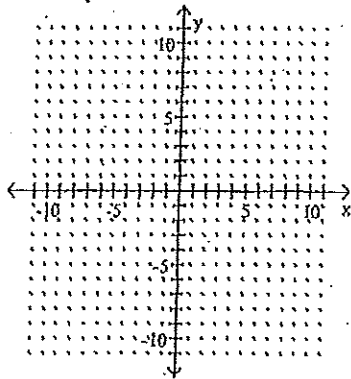
36. (3, 6) and (4, 12)

36. _____

37. Suppose 250 units were sold in 2004. Each year after sales were reduced by $\frac{1}{3}$. Let $s(t)$ be the sales of units in the years since 2004. Find an exponential equation for $s(t)$. How many units were sold in 2009?

37. _____

38. Sketch the graph of the given function, its inverse, and $y = x$ on the same axis. Graph the function and inverse as solid lines and $y = x$ as a dotted line. $F(x) = -4x - 5$



Find the inverse of each equation:

39. $f(x) = 7x + 9$

39. _____

40. $f(x) = x^2 + 5$

40. _____

Find the logarithm

41. $\log_3\left(\frac{1}{27}\right) =$

41. _____

42. $\log_3(\log_3 27) =$

42. _____

Evaluate:

43. Let $f(x) = 3^x$ find $f^{-1}(27)$

43. _____

44. Let $f(x) = \log_3(x)$ find $f^{-1}(-2)$

44. _____

Solve:

45. $5 \log_4(2x - 7) = 25$

45. _____

46. $\log_2(\log_5 x) = 3$

46. _____

47. $4^{3x-5} = 5$

47. _____

48. $-2(6^{2x}) + 30 = 3(6)^{2x} - 20$

48. _____

Express as a single log:

49. $3 \log(2x^2) + 4 \log(x^3) - \log(x^{10})$

49. _____

50. $5 \ln(2x^4) - \ln(16x^4)$

50. _____

Solve each equation:

51. $3 \log(4x^2) - \log(2x^4) = 3$

51. _____

52. $3 \ln(4x^2) - 15 = -7 + \ln x^4$

52. _____

53. Solve by using "intersect" on a graphing calculator $3e^x = 5x - 3$ Draw the graphs here to show your answer.

54. Jeff received a gift from his father of \$15000, which he invested at an annually compounded rate of 8%. Let $V = f(t)$ represent the value (in dollars) of the account after t years or any fraction thereafter. Find an equation for f . What will the value of the investment be in 14 years?

54. _____

55. Revenue from board games has decayed exponentially from \$9 million in 1990 to \$3 million in 2007. Predict when revenue will reach \$1 million.

55. _____

56. A storage tank contains radium, which has a half-life of 2000 years.

- i) Let $f(t)$ represent the percent of radium that remains in the tank at t years after the element was placed in the tank. Find an equation for f .
- ii) Predict when 20% of the radium will remain.

56. _____

