

Practice Problems for Placement into Math 158 College Algebra

Write an equation of the line in slope intercept from given the following information, then sketch its graph.

1. The point (5, -4) and slope $-1/2$
2. Points (-3, 4) and (5, 8)
3. Horizontal line passing through the point (2, -7)
4. The line perpendicular to $x+y=5$ through the point (2, -3)

Solve the system by the substitution method and the elimination method.

$$\begin{aligned} 5. \quad & x - 2y = 2 \\ & 4x - 5y = 5 \end{aligned}$$

Solve the system.

$$\begin{aligned} 6. \quad & x + y + z = 2 \\ & x - y + 2z = 2 \\ & x - 2y + z = -1 \end{aligned}$$

If $A = \{0, 1, 2, 3, 4, 5\}$ $B = \{1, 3, 5, 7\}$ $C = \{6\}$

7. $A \cup C$
8. $A \cap B$

Solve the inequalities. Graph the solution set and write it using interval notation.

9. $2x + 5 > 11$ and $-x + 3 > -4$
10. $2x + 1 \leq -7$ or $4x - 1 \geq 3$

Solve each equation.

11. $|x - 5| = 7$
12. $|2x + 3| = -1$

Solve each inequality. Graph the solution set and write it using interval notation.

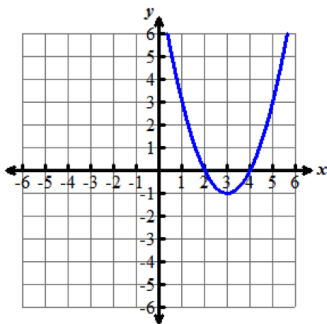
13. $|2x - 1| > 3$
14. $|x + 3| \leq 4$

Graph the solution set of the system of linear equations.

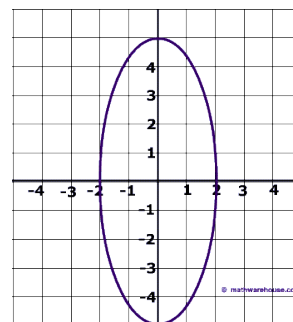
15. $x + 2y \geq -3$
 $3x + y < 5$

Determine whether each graph is a function and then identify the domain and range.

16.



17.



Let $f(x) = 3x + 1$ $g(x) = x^2 - 4$ $h(x) = x + 2$. Find the following.

18. $(f + g)(x)$

19. $(g - h)(x)$

20. $(fh)(x)$

21. $\left(\frac{g}{h}\right)(x)$

22. $(f \circ g)(x)$

23. $(g \circ h)(x)$

Evaluate.

24. $100^{-\frac{3}{2}}$

25. $(-8)^{\frac{2}{3}}$

26. $\left(\frac{16}{81}\right)^{-\frac{3}{4}}$

Simplify.

27. $\left(\frac{3x^{-3}y^2}{2x^2y^{-4}}\right)^{-2}$

28. $\sqrt[3]{-16x^5y^7}$

29. $2\sqrt[3]{54x^4} + 5\sqrt[3]{16x^4}$

30. $(2\sqrt{5} + \sqrt{3})(3\sqrt{5} - 2\sqrt{3})$

31. $\sqrt{\frac{2}{5}}$

32. $\sqrt[3]{\frac{2}{3}}$

Solve.

33. $\sqrt{3 - x} = x + 3$

34. $\sqrt[3]{x + 8} = -1$

Simplify.

35. $(2 + i) - (-3 - 2i)$

36. $(3 + 4i)(5 - 3i)$

37. $\frac{1+4i}{3+2i}$

Solve by factoring.

38. $x^4 - 29x^2 + 100 = 0$

Solve with the Square Root Property.

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

Solve by completing the Square.

40. $3x^2 - 12x + 15 = 0$

Solve with the Quadratic Formula.

41. $(x + 5)(x - 1) = -18$

Solve.

$$42. x^{\frac{2}{3}} - x^{\frac{1}{3}} - 12 = 0$$

Complete the square to get the equation in vertex form $y = a(x - h)^2 - k$, then find the vertex and sketch the graph of the parabola.

$$43. y = -3x^2 + 12x - 8$$

Find the inverse of the function.

$$44. f(x) = -2x + 3$$

Solve.

$$45. 9^x = \frac{1}{27}$$

$$46. \log_2 x = -3$$

$$47. \log_x 5 = \frac{1}{2}$$

Complete the square to get the equation in standard circle form $(x - h)^2 + (y - k)^2 = r^2$. State the center, radius and sketch the circle.

$$48. x^2 + y^2 - 4x + 6y - 12 = 0$$

Answers

1. $y = -\frac{1}{2}x - \frac{3}{2}$

2. $y = \frac{1}{2}x + \frac{11}{2}$

3. $y = -7$

4. $y = x - 5$

5. $(0, -1)$

6. $(-1, 1, 2)$

7. $\{0, 1, 2, 3, 4, 5, 6\}$

8. $\{1, 3, 5\}$

9. $(3, 7)$

10. $(-\infty, -4] \cup [1, \infty)$

11. $x = -2, 12$

12. *No solution*

13. $(-\infty, -1) \cup (2, \infty)$

14. $[-7, 1]$

15. *graph*

16. Yes, D: $(-\infty, \infty)$ R: $[-1, \infty)$

17. No, D: $[-2, 2]$ R: $[-5, 5]$

18. $x^2 + 3x - 3$

19. $x^2 - x + 6$

20. $3x^2 + 7x + 2$

21. $x-2$

22. $3x^2 - 11$

23. $x^2 + 4x$

24. $\frac{1}{1000}$

25. 4

26. $\frac{27}{8}$

27. $\frac{4x^{10}}{9y^{12}}$

28. $-2xy^2 \sqrt[3]{2x^2y}$

29. $16x \sqrt[3]{2x}$

30. $24 - \sqrt{15}$

31. $\frac{\sqrt{10}}{5}$

32. $\frac{\sqrt[3]{18}}{3}$

33. $x = -1$

34. $x = -9$

35. $5 + 3i$

36. $27 + 11i$

37. $\frac{11+10i}{13}$

38. $x = \pm 5, \pm 2$

39. $x = -5 \pm 2\sqrt{10}$

40. $x = 2 \pm i$

41. $x = -2 \pm 3i$

42. $x = 64, -27$

43. $y = -3(x - 2)^2 + 4, V:(2, 4)$

44. $f^{-1}(x) = -\frac{1}{2}x + \frac{3}{2}$

45. $x = -\frac{3}{2}$

46. $x = \frac{1}{8}$

47. $x = 25$

48. $(x - 2)^2 + (y + 3)^2 = 25, C: (2, -3) R=5$