

1. Solve for z: $2yz + 7z = y$.

2. Solve the inequality. Then graph the solution. $3(1 + x) > 1 + 5x$.

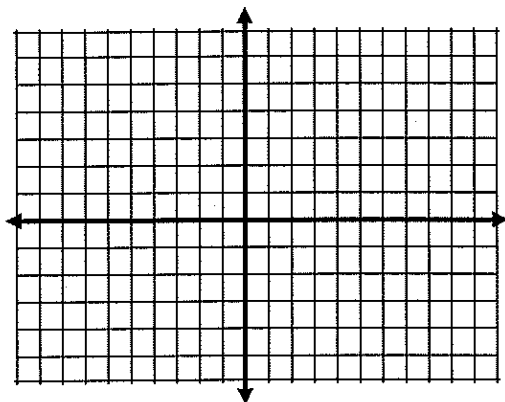


3. Find the slope of the line containing the points $(3, -1)$ and $(6, 4)$.

4. The drama club sold 1500 tickets for the end-of-year performance. Admission prices were \$12 for adults and \$6 for students. The total amount collected at the box office was \$15,480. How many students attended the play?

5. Sketch the graph of the system of linear inequalities. $2x + y \geq 0$
 $-3y + 6 > 0$

6. Find the vertex and axis of symmetry of the parabola: $y = -3x^2 + 12x - 8$.



7. Solve the equation: $4x^2 + 20 = 0$.

8. Simplify: $\frac{12x^{-3}}{y^4} \cdot \frac{(y^{-2}x^2)^{-1}}{15x^{-2}}$

9. Factor completely: $14x^3 - 21x^6$

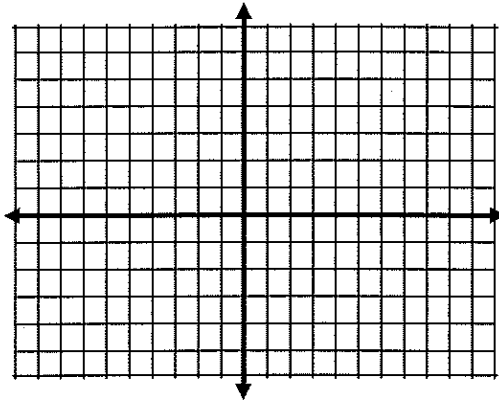
10. Find all real zeros of the function.
 $g(x) = 2x^3 - x^2 - 10x + 5$

11. Write the polynomial as a product of linear factors. $x^3 - 2x^2 - 9x + 18$.

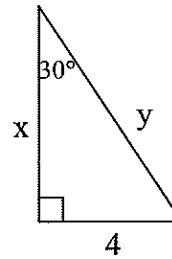
12. Evaluate: $(27)^{\frac{2}{3}}$

13. Use the change of base formula to evaluate the expression $\log_4 24$.

14. Sketch the graph of the function and its inverse on the same coordinate plane.
 $f(x) = 2 - 2x$.



15. Find the missing side lengths for x and y.



16. If \$2500 is invested at a rate of 5% compounded continuously, find the balance in the account after 6 years. Use the formula $A = Pe^{rt}$

17. Expand the expression: $\log_5 \left(5 \sqrt{\frac{x}{y}} \right)$

18. Solve for x: $\log_{10} 8 - \frac{1}{3} \log_{10} x = \log_{10} 2$.

19. Solve the equation: $6^{-0.2x} - 3 = 7$.

20. Identify all horizontal and vertical asymptotes of the graph of the function

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

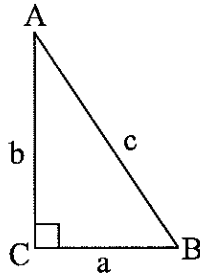
21. Perform the operation and simplify

$$\frac{3x - 5}{x^2 - 25} - \frac{2}{x + 5}$$

22. Find the points of intersection, if any, of the graphs in the system.

$$\begin{aligned} y^2 + 4x &= 0 \\ x + y &= 0 \end{aligned}$$

23. Solve $\triangle ABC$ using the diagram and the given measurements. $B = 50^\circ$, $a = 12$



24. The volume of a sphere can be given by the formula $V = 4.18879r^3$. You have to design a spherical container that will hold a volume of 95 cubic inches. What should the radius of your container be?

25. The number of bacteria present in a culture after t minutes is given as $B = 1000e^{kt}$. If there are 1438 bacteria present after 4 minutes, find k .

26. Simplify the expression: $\sqrt{\frac{2}{15}}$.

27. What are the solutions of $x^2 + 5x - 7 = 0$?

28. Write the expression as a complex number in standard form: $(5 - 4i)(3 + 6i)$.

29. Multiply: $(x + 1)(2x - 1)(x + 3)$.

30. Divide: $(x^3 - 6x + 7)$ by $(x - 2)$.

31. Solve: $5x^{\frac{3}{2}} = 320$.

32. Simplify: $3(5^{\frac{1}{3}}) + 4(5^{\frac{1}{3}})$?

33. Solve the equation: $\sqrt[3]{y-2} = 5$.

34. If $f(x) = 3x^2$ and $g(x) = -4x$,
find $f(g(x))$.

35. What is the simplified form of
 $5e^{-8} \cdot (-2e^3)^2$ in terms of e ?

36. What is the solution of $4^{4x} = 16^{x+1}$?

37. What is the solution of $\log_7(4x + 5) = 2$?

38. Simplify and reduce the rational expression.

$$\frac{\frac{2}{x+2}}{\frac{4}{x} + 2}$$

39. Solve. $\frac{x^2}{x-5} = \frac{25}{x-5}$

40. Find the equation that represents the perpendicular bisector of the line segment connecting (3, -1) and (-9, 5).

41. Simplify the rational expression.

$$\frac{x^2 + 2x - 24}{x^2 - 11x + 28}$$

42. Simplify the rational expression.

$$\frac{x^2 + 12x + 35}{x^2 - 25} \div \frac{x+7}{x-7}$$

43. The sides of a rectangle have length $x + 1$ and width $x - 7$. Find the perimeter and area of the rectangle in terms of x ?

44. The amount of money, A , accrued at the end of n years when a certain amount, P , is invested at a compound annual rate, r , is given by $A = P(1 + r)^n$. If a person invests \$100 in an account that pays 4% interest compounded annually, find the balance after 15 years.

45. Simplify: $\frac{30e^{18}}{20e^2}$.

46. Find the $\sin \theta$ and $\cos \theta$ of a radius from the origin to the point $(-3, 4)$.

47. Give the exact value of each expression in simplest radical form.

a. $\sin 225^\circ$

b. $\cos 330^\circ$

c. $\sin \pi$

d. $\cos -\frac{\pi}{2}$

48. Change radians to degrees.

a. $-\frac{3\pi}{4}$

b. 3.5

49. Change to radians. Leave your answers in terms of π .

a. -616°

b. 212°

50. In triangle ABC , $\angle B = 30^\circ$, $\angle A = 135^\circ$, and $b = 4$. Find a , c , and $\angle C$.

51. In triangle ABC , $\angle C = 25^\circ$, $b = 3$, and $c = 2$. Find a , $\angle A$, and $\angle B$.

52. A triangle has sides 5, 9, and 10. What is the measure of the smallest angle?