

Some Precalculus Problems

- Express the area of a circle, A , in terms of its circumference, C .
- Simplify: $\sqrt[3]{\frac{-16x^3}{2y^6}}$.
- Perform the indicated operations and simplify: $(m^{n+1}r^n)(3m^n r^{2n})^{-1}$.
- Perform the indicated operations and simplify: $\frac{ab}{\frac{1}{a} + \frac{1}{b}}$.
- Find $f^{-1}(x)$ for $f(x) = \frac{1-3x}{4}$.
- Evaluate $(5x+1)^{3/4} - (7-x)^0$ for $x=3$.
- Evaluate $-(2b^2)^{-1}$ when $b=-2$.
- Find the interval where $g(x) > 0$ if $g(x) = -x^2 - x + 6$.
- If $f(t) = \frac{2}{1-t}$, for what value of t does $f(t) = 3$?
- Simplify completely: $2u(3u^2 - 1) - (-8u^3 - 14u + 6)$.
- Simplify completely: $4(2x+1)^2 + 3(2x+1) + 1$.
- Factor completely: $32x^4y - 162y$.
- What is the remainder when $5x^2 - 2x + 1$ is divided by $x - 1$?
- Find a so that the two lines do not intersect: $y = 4x + 2$, $y - 3 = ax$.
- Perform the indicated operation and simplify: $\frac{4m^2 - v^2}{3m - 1} \div \frac{2m^2 + mv}{3m - 1}$.
- Perform the indicated operation and simplify: $\frac{3c}{c-2} + \frac{c+1}{2-c}$.
- Simplify completely: $\frac{\frac{a}{1} - \frac{x}{a}}{\frac{x}{1} - \frac{a}{x}}$.
- Solve for z : $7z - (4z - 9) = 24 + 5(z - 1)$.
- Solve for x : $\frac{a}{3} + 5x = b\left(\frac{x}{3} + 2\right)$.
- Solve for r : $S = \frac{2r - a}{r - 1}$.
- Solve for R : $V = \frac{3R}{a} - \frac{R}{b}$.
- Solve for t : $2t^2 + 4t = 9t + 18$.
- Solve for s : $-2s^2 - 4s + 2s^3 = 0$.

24. Solve for m : $m^3 + 3m^2 - 4m - 12 = 0$.

25. Solve for p : $\frac{4}{p} - \frac{2}{p+1} = 3$.

26. To get a B in a course a student must have an average of at least 80% on five tests that are worth 100 points each. On the first four tests a student scores 92%, 83%, 61%, and 71%. Determine the lowest score the student can receive on the fifth test to assure a grade of B for the course.

27. The area of a rectangle is 84 square feet and the length is 6 feet longer than the width. If w represents the width, write an equation that could be used to find the dimensions of the rectangle.

28. A furniture store drops the price of a table 37 percent to a sale price of \$364.77. What is the original price?

29. The cost of mailing envelopes by bulk mail is \$35 for the first 200 plus \$0.12 for each additional envelope over 200. Write a function to represent the cost of mailing x envelopes when $x \geq 200$.

30. Solve for t : $(t+2)^2 = 8$.

31. Solve for y : $-15y + 6y^2 = -y$.

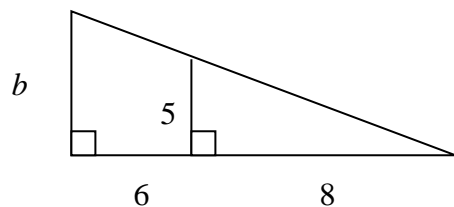
32. Solve for z : $z^2 - 4z + 6 = 0$.

33. If a solution to $f(x) = 0$ is $x = 5$, find a solution to $3f(x+2) = 0$.

34. Solve for x : $\sqrt{x+6} = x$

35. Solve for r : $5 - 3r \leq 8$.

36. Find the length of b :



37. Find the area of the triangle bounded by $y = 5 - 2x$, the x -axis, and the y -axis in the first quadrant.

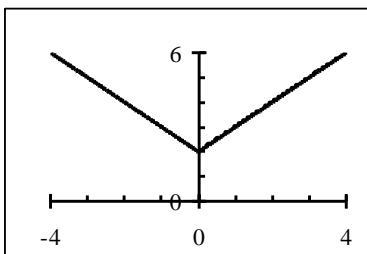
38. Solve for x : $|2x+1| \geq 7$.

39. Find the domain of $y = \sqrt{4-5x}$.

40. Graph $y = \frac{6}{x}$.

41. Find the intercepts of $y - 2x^2 - 13x = 6$.

42. Find the equation of the graph :



43. Find the distance between $(6,3)$ and $(-2,4)$.

44. Find the midpoint of the line segment joining $(6,9)$ and $(-3,1)$.

45. What is the range of $y = 2(3)^x$?

46. Find the equation of the line perpendicular to $3y + 2x - 3 = 0$ passing through $(4,-1)$.

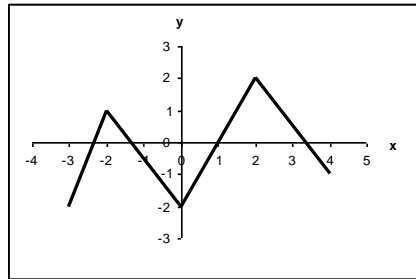
47. Find $f(-4)$ if $f(x) = \frac{2x^2 - 11}{3x}$.

48. Find $f(b+2)$ if $f(x) = 5 - 3(x+1)$.

49. Find the domain of $g(x) = \frac{1}{x^2 - x - 12}$.

50. Find $h(3)$ if $h(t) = \begin{cases} 2t^2 - 5 & t < -1 \\ 4 - 3t & t \geq -1 \end{cases}$.

51. Find the domain and the range of the function:

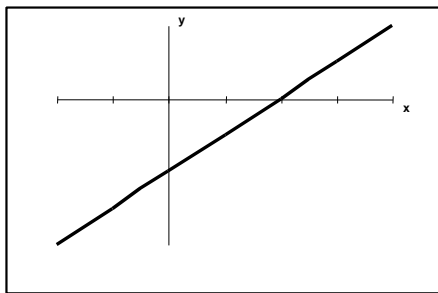


52. If $(5,6)$ is a point on the graph of $y = g(x)$, find a point on the graph of $y = -g(x) + 1$.

53. Find $g(f(-2))$ if $f(x) = \log_4(-8x)$ and $g(x) = x - 3$.

54. If $h(t) = \frac{t}{t+1}$, find the value of t so that $h(t) = 3$.

55. If the graph of $y = f(x)$ is below, sketch the graph of $y = |f(x)|$.



56. Sketch the graph of $y = \log_3(x+2)$.

57. Rewrite $5^b = a$ in logarithmic form.

58. Rewrite as a single logarithm: $\frac{1}{2} \log x + 4 \log y - 2 \log z$.

59. Solve for t : $3^{2t} = 27^{2t-1}$.

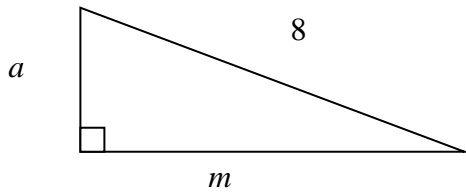
60. Solve for r : $3 + 6e^{2r} = 5$.

61. Solve for y : $\log_3 y - \log_3(y-1) = 2$.

62. Solve the system of equations: $\begin{cases} 4x + 3y = 0 \\ 8x = 9y + 2 \end{cases}$.

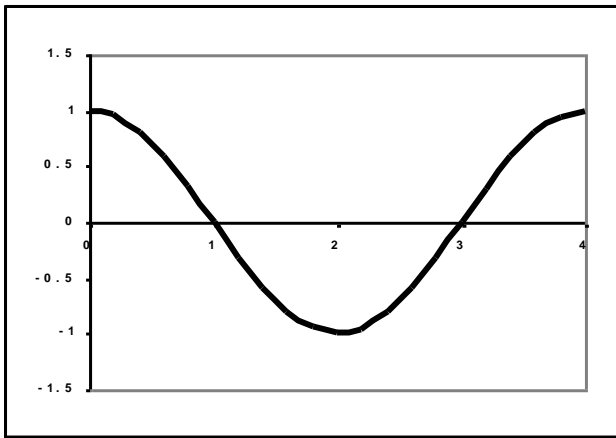
63. If $f(x) = -x^2$ and $g(x) = x + 4$, find the values of x so that $g(f(x)) > 0$.

64. Express the length of side a in terms of m :



65. If $\tan \theta = B$ where θ is an angle in quadrant I, express $\sin \theta$ in terms of B .

66. Find the trigonometric equation for this graph:



67. $\sin(\theta + \pi) =$

68. Find $\cos\left(\frac{4\pi}{3}\right)$.