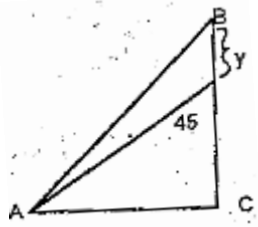
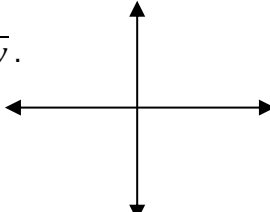
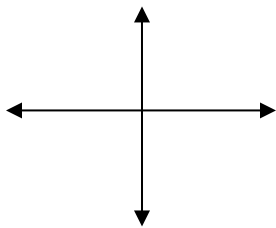


AP Calculus AB: Are you ready?????**NOTE: these questions do not require a calculator!**

- If $x = 3$, $y = 5$, and $\frac{1}{z} = \frac{1}{x} + \frac{1}{y}$, then $z = ?$
- Completely Factor: $4x^2 - 36$
- If the two solutions of the quadratic equation $4x^2 + 4x + k = 0$ are equal, find k
- If the roots of a quadratic equation are $-\frac{3}{2}$ and $\frac{4}{5}$, find a possible equation with integral (i.e. integer) coefficients.
- Simplify: $\frac{x^{-2}y^{-6}}{3x^{-4}y^3}$
- Simplify: $(\sqrt{3x} + \sqrt{5y})^2$
- Simplify: $(x^{\frac{1}{2}}x^{\frac{3}{2}})^{\frac{1}{7}}$
- If $y = \left(\frac{1}{2}\right)^x$, find y when $x = -2$
- Convert $\log_{10} 10,000 = 4$ to exponential form
- Solve for b : $\log_b 81 = 4$
- Expand. No exponents in answer: $\log_2[(\sqrt[3]{x})y]$
- The equation of the line containing $(1,5)$ and $(4,3)$ is (you may write the answer in any of the 3 forms)
- Condense into one logarithm: $\log 6 + \log 5 - \log 3$
- Simplify: $(\csc^2\theta - 1)\tan^2\theta$
- Which of the following is an identity:
 - $\sin x = 1$
 - $\sin x + \cos x = 1$
 - $\sin x = \cos(90^\circ - x)$
 - $\cos^2 x - \sin^2 x = 1$
 - $\sin x + \sin 2x = \sin 3x$
- Determine if $x + 2$ is a factor of $x^5 + 3x^4 - 2x + 4$.
- What is the horizontal distance from the base of a tree 36 feet tall if the angle of elevation is 52° ? (Give the exact answer)
- If $f(x) = x^2 - 1$ and $g(x) = 2x + 1$, find $f(g(x))$. (unsimplified)
- Let $f(x) = 2x^{\frac{1}{3}} + 27$. Find $f^{-1}(x)$.
- If $\sin A = -\frac{3}{7}$ in the 3rd quadrant, find $\cos A$.

21. Solve: $\log_2(6 - 2x) - \log_2 x = 3$.
22. Give the x-intercept of the graph of $f(x) = \log(x - 2)$.
23. In right triangle ABC below where $AC = 2$ and $\angle BAC = \theta$, find y in terms of θ .
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24. State the period of the function $f(x) = 4 \sin(3x)$.
25. Which of the following functions is decreasing on its entire domain:
- $y = \cos x$
 - $f(x) = |x|$
 - $f(x) = \frac{1}{x}$
 - $f(x) = 10^{\frac{x}{2}}$
26. Simplify: $\left(\frac{3x^2y^3}{xw^{-2}}\right)^3$.
27. Evaluate: $\frac{1}{27^{\frac{1}{3}}}$.
28. Simplify: $\sqrt[3]{24x^3y^{12}}$.
29. Write in exponential form: $\sqrt[3]{7x^2}$.
30. Simplify: $3x^{-\frac{2}{3}}4x^{\frac{1}{2}}$.
31. Which of the following are polynomials:
- $x + x^{-1}$
 - $3x^2 + \sqrt{7}x - 8$
 - $\frac{x+1}{x-1}$
 - $\tan(4x)$
32. Simplify:
 $(2x^3 + 5x^2) + 2(-7x^3 - 2x^2) - (6x^3 - 12x - 3)$
33. Multiply: $(3x - 7)(2x + 9)$.
34. Factor: $x^2 + x - 12$.
35. Give the domain of $(x) = \frac{3x+1}{x^2-2x}$.
36. Give the domain of $(x) = \sqrt{3-x}$.
37. Describe the transformation that takes place from $y = f(x)$ to $y = 2 + f(-x)$.
38. Sketch the graph of $y = \sqrt{x}$.
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39. Sketch the graph of $y = 1 + \log x$.



40. If $a^{10} = 4900$, find a^5 .

41. Find $\tan(2x)$ if $x = \frac{\pi}{3}$.

42. Find $\cos(3x)$ if $x = \frac{\pi}{6}$.

43. If $px^2 + qx + r = 0$, then $x =$ (answers will be in terms of p , q , and r)

44. Suppose that $f(1) = 3$, $f(2) = 1$, $f(3) = 1$, $g(1) = 2$, $g(2) = 2$, and $g(3) = 3$. Find $(g(f(2) + 2))$.

45. Find the solution set of $|x + 3| < 7$.

46. If $f(x) = x^2$, substitute and simplify $\frac{f(x+h)-f(x)}{h}$.

47. The equation of the circle whose radius is 4 and whose center is $(1, -3)$ is

48. Find the equation of any line that is perpendicular to $3x - y = -4$.

49. Which of the following functions has a “corner” in its graph:

A. $f(x) = 7x^2 + 5$

B. $m(x) = |x - 2|$

C. $g(x) = \frac{x+1}{x}$

D. $j(x) = x^3$

50. How many different real numbers satisfy the equation $6x - x^2 = 9$?

51. A circle of radius 1 is centered at the origin. A square with side length 2 is also centered at the origin. Find an approximation for the ratio of the area of the circle to the area of the square.

52. If $|x - 3| \leq 4$, what is the largest possible value of $|x - 5|$?

53. Which of the following is false for some real number x :

A. $x^2 - x + 1 > 0$

B. $x = \sqrt{x^2}$

C. $1 = (x^2 + 1)/(x^2 + 1)$

D. $x = \sqrt[3]{x^3}$

54. Simplify: $\frac{6x^4y - 2xy^4}{2xy}$.

55. The graph of $x - 3y + 12 = 0$ crosses the y -axis at

56. If the length of a rectangle is 8 more than its width, what is the area of the rectangle?

57. If $\{x, y\} > 0$ (i.e. both x and y are positive), then

$$\sqrt{27\sqrt{81x^8y^6}} =$$

58. Describe the system (one solution, no solutions, infinitely many solutions):

$$\begin{aligned}x + 4y &= 1 \\3x + 8y &= 2\end{aligned}$$

59. If $f(x) = \frac{1-x}{x}$, for what value(s) of x does $f(x) = 0$?

60. What is the maximum number of times the graph of a fifth degree polynomial could intersect a linear polynomial?

61. Solve: $(3 - x)(1 + x) < 0$.

62. If $p \neq q$ and $p(x + q) = qx - s$, then $x =$ (write your answer in terms of p , q , and s)

63. $\log_{49} \left(\frac{1}{7} \right) =$

64. Consider right triangle PQR with right angle Q . If $\csc P = 5$ and (side) $q = 4$, then (side) $p =$

65. Simplify: $\sin \varphi \tan \varphi \csc^2 \varphi$.

66. Let $f(x) = \frac{1}{x^2}$. What happens to the y -values as your x -values get closer to $x = 0$?

67. Simplify: $\log_3(3^{-2})$.

68. Rewrite as a piecewise defined function:

$$f(x) = |3x - 5|$$

69. A kite is 100 m above the ground. If there are 200 m of string out, find the angle of elevation.

70. Two cars start moving from the same point. One travels south at 100 km/hr, the other west at 50 km/hr. How far apart are they two hours later?

71. How many total squares are on a standard 8×8 checkerboard?

72. Find the inverse of $f(x) = \log_2 x$.

73. Simplify $\frac{\frac{1}{x+h} - \frac{1}{x}}{h}$