

Problems with an answer of 1 have always been my favorite. How many of the following have an answer of 1? Show your work!

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1. $\frac{2y+2}{(y+1)^2} + \frac{y-1}{y+2} =$

2. $(\sqrt{14} + \sqrt{13})(\sqrt{14} - \sqrt{13}) =$

3. Find the distance between these two points: (-5, 3) and (-4, 3)

4. $\log 10 =$

5. $[(72x^3y^4)(5xy)] =$

6. ${}_{14}C_{14} =$

7. Use the quadratic formula to find the value of the discriminant for $3x^2 + 7x + 4$.

8. What is the radius of this circle? $4x^2 + 4y^2 - 16x - 12y + 21 = 0$

9. $\begin{vmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{vmatrix} =$

10. $\begin{bmatrix} 4 \\ 2 & 3 & -1 \\ -3 \\ -2 \end{bmatrix} =$

11. What is the slope of the line containing (2, 5) and (-4, -1)?

12. How many different ways can a committee of 4 be selected from a pool of 4 people?

13. The sum of $\frac{1}{2}$ a number and $\frac{1}{3}$ the sum of the number and 7 equals 2. Find the number.

14. $\frac{(2x^2 - 98)(x^3 + 4x^2 - 21x)}{2(x+7)^2(x^3 - 10x^2 + 21x)} =$

15. $\left(\frac{1}{2}\right)^{-3} - \left(\frac{3!}{42}\right)^{-1} =$

16. $\sum_{x=1}^{10} 3x - 16.4 =$

17. Solve for x: $3^{5x-1} = 81$

18. How much of a 90% salt solution should be added to 25 lbs of a 12% salt solution to produce a 15% salt solution?

19. $\frac{x}{x+y} - \frac{2y^2}{x^2-y^2} + \frac{y}{x-y} =$

20. $-\left(-\frac{\sqrt{2}}{2} + \frac{i\sqrt{2}}{2}\right)^4 =$

21. $\begin{vmatrix} 5 & -9 \\ 4 & -7 \end{vmatrix} =$

22. $\log_{\frac{1}{2}} .5 =$

23. $i^{92} =$

24. A drawer contains 10 black socks. If you choose 2 socks at random, what is the probability that they are both black?

25. Find a_{18} in the arithmetic sequence given $a_1 = 50$, and $d = 3$.

26. $\left. \begin{array}{l} x + y + 2z = 1 \\ 2x + y - z = 5 \\ x + 2y + z = 4 \end{array} \right\} x =$

27. $\frac{\log_5 125}{\log_2 8} =$

28. $(y^2 - 3y + 9)(y^2 + 3y + 9) - (y^4 + 9y^2 + 80) =$

29. Find the y-intercept of the following line: $3x + 4y = 4$

$$30. \left(-\frac{1}{2} + \frac{i\sqrt{3}}{2} \right) \left(-\frac{1}{2} - \frac{i\sqrt{3}}{2} \right) =$$

$$31. \text{ Solve for } x: \log x = 0$$

$$32. x^2 - y^2 = 4. \text{ For this hyperbola, the slopes of the asymptotes are } -1 \text{ and } \underline{\hspace{2cm}}.$$

$$33. -[4(5-3) - 2(4-7)] \div [2(-1-6)] =$$

$$34. \text{ What is the geometric mean between } \frac{3}{5} \text{ and } \frac{5}{3}.$$

$$35. (5-3y) - (7+9y) - (-3-12y) =$$

$$36. \frac{x^3 - 8}{x^3 - 4x} \cdot \frac{x^3 + 2x^2}{x^3 + 2x^2 + 4x} =$$

$$37. \frac{-4}{4i^6} =$$

$$38. \text{ If you flip a coin 5 times, there are 32 possible outcomes. How many of these outcomes contain no heads?}$$

$$39. \frac{64^{\frac{-5}{6}}}{2^{-5}} =$$

$$40. \frac{3x-2}{2x-3} \cdot \frac{3-2x}{2-3x} =$$

$$41. \text{ Find the positive solution for } x: \sqrt{2x+7} - \sqrt{x+3} = 1$$

$$42. (x^2)^{\frac{1}{2}} (x^{-2})^{\frac{1}{2}} =$$

$$43. i^{13} + i^{16} + i^{19} =$$

$$44. (\sqrt[3]{2}-1)(\sqrt[3]{4} + \sqrt[3]{2} + 1) =$$

$$45. {}_1P_1 =$$

46. A box contains 4 red marbles, 3 blue marbles, and 2 white marbles. How many random selections of three marbles contain all three blue?

47.
$$\frac{(x^3y^2 - 3x^2y)(x^2y^2 - 3xy)^1}{x} =$$

48. Solve for x: $3 + 3x^2 = 6x$

49. What is the positive x-intercept of this ellipse? $16x^2 + y^2 = 16$

50. $|8 - 5| - |5 - 7| =$

51. $9(1 - 4)^{-2} =$

52. For this parabola, $x = 4y^2 - 8y + 7$, the equation of the axis of symmetry is $y = \underline{\hspace{2cm}}$.

53. $[2 + 2(-8)] \div (-14 + 7) - 1 =$

54. $-2i(5i) =$

55. Give the coordinates of the midpoint between (-5, 3) and (7, -1).

56. Find a_1 in a geometric series given $S_7 = 127$, and $r = 2$.

57. $\log_3 3 =$

58. $\left(\frac{1}{27}\right)^{\frac{-2}{3}} (3)^{-2} =$

59. $-\ln\left(3e^{\frac{x-1}{1-x}} - 2e^{\frac{y-2}{2-y}}\right) =$

60. What is the rightmost root of the following equation? $|x^3 + 5x^2 + 3x + 2| = 11$

Bonus.

61. $-e^{\pi i} =$