

- \_\_\_\_\_ 1. Solve:  $\log_2(x-2) + \log_2 x = 3$
- \_\_\_\_\_ 2. Solve:  $\sqrt[3]{x^2 - 4x - 4} = \sqrt[3]{-3x + 2}$
- \_\_\_\_\_ 3. Line  $L$  containing the point  $(-11, -4)$  has the same  $y$ -intercept as  $y = -3x - 2$ . What is the product of the  $y$ -intercept and the slope of line  $L$ ? Express your answer as a common fraction.
- \_\_\_\_\_ 4. The difference of the squares of two distinct positive numbers is equal to twice the square of their difference. What is the ratio of the smaller number to the larger? Express your answer as a common fraction.
- \_\_\_\_\_ 5. If  $f(x) = x^2 - 3$  and  $g(x) = 2x + 1$ . Find  $(g \circ f)(3)$ .
- \_\_\_\_\_ 6. Approximate  $\log_4 45$ . Round your answer to three decimal places
- \_\_\_\_\_ 7. Find the area of the circle with the given equation:  $x^2 + y^2 + 8x - 2y = 8$ . Leave your answer in terms of  $\pi$ .
- \_\_\_\_\_ 8. Find the sum:  $6 - 2 + \frac{2}{3} - \frac{2}{9} + \dots$
- \_\_\_\_\_ 9. Find the 6<sup>th</sup> term in the expansion of  $(2x - 3)^8$
- \_\_\_\_\_ 10. If  $x + y = 5$  and  $x - y = 1$ , what is the value of  $2^{x^2 - y^2}$
- \_\_\_\_\_ 11. What is the positive value of  $x$  which satisfies  $3^{-2} + 4^{-2} = x^{-2}$ . Express your answer as a decimal to the nearest tenth.
- \_\_\_\_\_ 12. Evaluate  $x^3 - y^2$  when  $x = -1$  and  $y = -2$
- \_\_\_\_\_ 13. What is the sum of all real solutions to the equation  $\sqrt{x + \sqrt{9 - x}} = 3$
- \_\_\_\_\_ 14. If it takes 96 people 6 days to pave 1 mile of road, how many days will it take 64 people to pave two miles of road?