Question 1. If \( x + y = 3, y + z = 5, \) and \( x + z = 7, \) what is \( x + y + z? \) Answer: 4

Question 2. What does \( \left( \frac{1}{16} \right)^{\sin \frac{4\pi}{4}} + \left( \frac{1}{3} \right)^{\cos \frac{2\pi}{3}} - \left( \frac{\sin \frac{4\pi}{3}}{\cos \frac{2\pi}{3}} \right)^2 \) equal? Answer: \( \frac{15}{2} \)

Question 3. What does \( \cos \left( \frac{\pi}{8} \right) \) equal? Answer: \( \sqrt{\frac{2 + \sqrt{2}}{4}} \)

Question 4. A parabola that is an even function passes through the points \((1,5)\) and \((\sqrt{3},-1)\). Find the equation of the parabola. Answer: \( y = -3x^2 + 8 \)

Question 5. How many rectangles are in the given figure? Answer: 30

Question 6. What is the \( y \)-intercept of the line passing through the center of the circle \( x^2 + y^2 + 2x - 6y = \sqrt{\frac{\pi}{2}} \) whose slope is 4? Answer: 7

Question 7. 64 is divided into three parts with the proportion 2:4:6. What is the value of the largest part? Answer: 32

Question 8. Solve the equation: \( 2^x + 2^x + 2^x + 2^x + 2^x + 2^x + 2^x + 2^x = \left( \sqrt{2} \right)^{12} \). Answer: 3

Question 9. What number when tripled and then squared equals one less than 6 times the number? Answer: \( \frac{3}{2} \)

Question 10. If \( \tan(t) = \frac{2}{3}, \pi \leq t \leq \frac{3\pi}{2} \), what is \( \cos(t) \csc(t) \)? Answer: \( \frac{1}{3} \)

Question 11. What is the length of the semi-minor axis of the ellipse with center \((0,0)\) and focus \((0,3)\) and vertex \((0,5)\)? Answer: 4

Question 12. Consider two positive numbers such that their difference is 2 and their product is 48. What is the smaller number? Answer: 6

Question 13. Simplify \( \frac{1 + 2 + 3 + \ldots + 9}{2 + 4 + 6 + \ldots + 10} - 2 \) to lowest terms. Answer: \( -\frac{1}{2} \)

Question 14. There are three values where the function \( f(x) = 1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{x}}} \) is undefined. One of them is -1. What are the other two values? Answer: \( \frac{-1}{2} \) and 0

Question 15. The sum of the first \( n \)-terms of a sequence is \( n^2 + 7n \). Find the 1013th term of the sequence. Answer: 2032

Question 16. Find the point of intersection of the lines \( x + 2y = 3 \) and \( 2x - y = 3 \). Answer: \( \left( \frac{9}{5}, \frac{3}{5} \right) \)