

1. The formula for converting temperature in Celsius to temperature in Fahrenheit is $F = \frac{9}{5}C + 32$. For a quick estimate of Fahrenheit temperature, Johnny doubles the temperature in Celsius and adds 30. For what Celsius temperature does Johnny's method yield the correct Fahrenheit temperature?

1. _____

2. A rectangular prism is being designed to have a volume of 36 cubic units. Find the minimum surface area in square units for the prism if the edge lengths are positive integers.

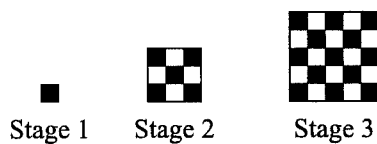
2. _____

3. Matt and Claire hiked to a point $\frac{3}{4}$ the way up the mountain in 43 minutes and 12 seconds. They took the same amount of time to hike each half of the distance from bottom to top. It took them 1 minute and 36 seconds longer to hike the third quarter than the fourth quarter. How many minutes did it take them to hike the entire mountain from bottom to top? Express your answer as a decimal to the nearest tenth.

3. _____

4. In each stage of the pattern shown, the number of black tiles is one more than the number of white tiles. Further, the side length at each stage increases by 2. How many black tiles will the 16th stage contain?

4. _____



5. A three-digit number is created with three different digits from the set $\{1, 2, 3, 4, 5\}$. What is the probability that the number is a multiple of 15? Express your answer as a common fraction.

5. _____

6. Each of the symbols \star and \ast represent an operation in the set $\{+, -, \times, \div\}$, and $\frac{12\star 2}{9\ast 3} = 2$. What is the value of $\frac{7\star 3}{12\ast 6}$? Express your answer as a common fraction.

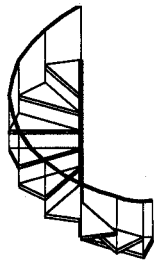
6. _____

7. There is only one set of five prime numbers that form an arithmetic sequence with a common difference of 6. What is the sum of those five prime numbers?

7. _____

8. A spiral staircase turns 270° as it rises 10 feet. The radius of the staircase is 3 feet. What is the number of feet in the length of the handrail? Express your answer as a decimal to the nearest tenth.

8. _____



9. Let u, v, w, x, y and z be six different integers selected from 1 to 9. What is the smallest possible value of $\frac{x}{y} + \frac{u}{v} + \frac{w}{z}$? Express your answer as a decimal rounded to the nearest hundredth.

9. _____

10. How many equilateral triangles can be formed within the same plane using at least two vertices that are also vertices of a given regular hexagon?

10. _____