

## Solutions to Nines Clock Puzzle Challenge – There are only 4 solutions.

(rev 09/21/2021)

### 2

$$\begin{array}{l}
 1 = \frac{2}{2} \quad 2 = 2 \quad 3 = 2 + \frac{2}{2} \quad 4 = 2 + 2 = 2^2 \quad 5 = 2^2 + \frac{2}{2} \quad 6 = 2^2 + 2 \\
 7 = 2^2 \times 2 - \frac{2}{2} \quad 8 = 2^2 \times 2 \quad 9 = 2^2 \times 2 + \frac{2}{2} \quad 10 = 2^2 \times 2 + 2 \quad 11 = 2 \times (2^2 + 2) - \frac{2}{2} \\
 12 = 2 \times (2^2 + 2) \quad 13 = (2 \times 2)^2 - \left(2 + \frac{2}{2}\right) = 2^{2 \times 2} - \left(2 + \frac{2}{2}\right) \quad 14 = (2 \times 2)^2 - 2 = 2^{2 \times 2} - 2 \\
 15 = (2 \times 2)^2 - \frac{2}{2} = 2^{2 \times 2} - \frac{2}{2} \quad 16 = 2^{2 \times 2} = (2 \times 2)^2 \quad 17 = 2^{2 \times 2} + \frac{2}{2} \\
 18 = 2^{2 \times 2} + 2 \quad \mathbf{19 = ?}
 \end{array}$$

### 3

$$\begin{array}{l}
 1 = \frac{3}{3} \quad 2 = 3 - \frac{3}{3} \quad 3 = 3 \quad 4 = 3 + \frac{3}{3} \quad 5 = 3 + \left(3 - \frac{3}{3}\right) \quad 6 = 3 + 3 \\
 7 = 3 \times 3 - 3 + \frac{3}{3} \quad 8 = 3 \times 3 - \frac{3}{3} \quad 9 = 3 \times 3 \quad 10 = 3 \times 3 + \frac{3}{3} \quad 11 = 3 \times 3 + 3 - \frac{3}{3} \\
 12 = 3 \times 3 + 3 \quad 13 = \frac{(3^3 \times 3) - 3}{3 + 3} \quad \mathbf{13 = ?}
 \end{array}$$

### 4 = 2<sup>2</sup>

$$\begin{array}{l}
 1 = \frac{4}{4} \quad 2 = \sqrt{4} \quad 3 = \sqrt{4} + \frac{4}{4} \quad 4 = 4 \quad 5 = 4 + \frac{4}{4} \quad 6 = 4 + \sqrt{4} \\
 7 = 4 + 4 - \frac{4}{4} \quad 8 = 4 + 4 = \frac{4 \times 4}{\sqrt{4}} \quad 9 = 4 \times \sqrt{4} + \frac{4}{4} \quad 10 = \sqrt{4} \times \left(4 + \frac{4}{4}\right) \quad 11 = 4 \times \sqrt{4} + \left(4 - \frac{4}{4}\right) \\
 12 = 4 \times \left(\sqrt{4} + \frac{4}{4}\right) \quad 13 = 4 \times 4 - 4 + \frac{4}{4} \quad 14 = 4 \times 4 - \sqrt{4} \quad 15 = 4 \times 4 - \frac{4}{4} \quad 16 = 4 \times 4 \\
 17 = 4 \times 4 + \frac{4}{4} \quad 18 = 4 \times 4 + \sqrt{4} \quad 19 = 4 \times 4 + \left(4 - \frac{4}{4}\right) \quad 20 = 4 \times 4 + 4 \\
 21 = \sqrt{\left(\frac{(4 \times 4 + 4)}{4}\right)^4} - 4 \quad 22 = \sqrt{4 \times \left(\frac{4}{4} - 4\right)^4} + 4 \quad 23 = 4 \times (4 + \sqrt{4}) - \frac{4}{4} \\
 24 = 4 \times (4 + \sqrt{4}) \quad 25 = 4 \times (4 + \sqrt{4}) + \frac{4}{4} \quad \mathbf{26 = ?}
 \end{array}$$

$$\mathbf{9 = 3^2}$$

$$1 = \frac{9}{9} \quad 2 = \frac{9+9}{9} = \sqrt{9} - \frac{9}{9} \quad 4 = \sqrt{9} + \frac{9}{9} \quad 5 = 9 - \left( \sqrt{9} + \frac{9}{9} \right) \quad 6 = 9 - \sqrt{9}$$

$$7 = 9 - \frac{9+9}{9} = 9 + \frac{9}{9} - \sqrt{9} \quad 8 = 9 - \frac{9}{9} \quad 9 = 9 \quad 10 = 9 + \frac{9}{9} \quad 11 = 9 + \sqrt{9} - \frac{9}{9}$$

$$12 = 9 + \sqrt{9} \quad 13 = ?$$