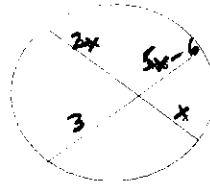


1. Given $f(x) = x^2 - 1$, $g(x) = 3x + 4$, $h(x) = 2$. Find the value of $(g(1)) + g(f(2)) + h(g(f(3)))$.
3. Let $A = (\log_{49} 256)(\log_{16} 27)(\log_{81} 343)$ $B = \sqrt{132 + \sqrt{132 + \sqrt{132 + \dots}}}$
 $C =$ the units' digit of 17^{71} $D = 4 * 2$ if
 $p * q = 2p - q + \frac{p^2}{q}$. Find $\frac{AB}{C} + D$.
5. Solve for x in the given diagram:



7. Find matrix B if
$$\begin{bmatrix} 4 & -1 \\ 2 & 1 \end{bmatrix} B - \begin{bmatrix} 6 & 3 \\ -1 & -4 \end{bmatrix} = \begin{bmatrix} 10 & -9 \\ 3 & -7 \end{bmatrix}.$$

9. A bell on a clock rings as follows: 1 time at the quarter hour (e.g., 12:15), 2 times at the half hour (e.g., 2:30), 3 times at the three-quarters hour (e.g., 5:45), X times at X:00, where $1 \leq X \leq 12$. If the clock starts running on January 31, 11:59 P.M., what time of whatday is being noted by the bell ringing the 1997th time?

11. If $x + y = 7$ and $x^2 + y^2 = 33$, what is $x^3 + y^3$?

13. If $f(x) = 3x + 1$ and $g(x) = (x - 1)^2$, what is the sum of all solutions of $f(g(x)) = g(f(x))$?

15. Evaluate: $\sum_{n=1}^{\infty} \left(\frac{1}{2^n} + \frac{1}{2^{n+1}} + \frac{1}{2^{n+2}} + \dots \right)$

2. In how many distinguishable ways can you arrange the letters in the word MATHEMATICAL?

4. Evaluate: $\frac{2}{5} + \frac{3}{5} + \frac{4}{15} + \frac{12}{25} + \frac{8}{45} + \frac{48}{125} + \frac{16}{135} + \dots$

6. What exact value(s) of u give(s) the equation $x^2 + 20 = ux$ one unique solution?

8. Find the sum of all integer values of m which satisfy $|m - 12| < 30$.

10. $\sqrt{9 + \sqrt{56}} - \sqrt{12 + \sqrt{140}} = \sqrt{A} - \sqrt{B}$, where the radicals are non-simplifiable. What is the value of A^B ?

12. Let complex number $z = 2 - 2i$. Now, $\bar{z} + |z|^2 + z^{-1} + z^3 = x + yi$. What is $x + y$?

Note: $\bar{u} = a + bi$ if $u = a - bi$

14. When four integers are added three at a time, the distinct sums are 117, 153, 170, and 184. What is the sum of all four original integers?