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| 1. **Computer Number Systems**   167438 = 001 110 111 100 0112  So there are 9 1’s. | **1.** 9 |
| **2. Computer Number Systems**  3F6A16 = 0011 1111 0110 10102  = 0 011 111 101 101 0102  = 3 7 5 5 28 | **2.** 375528 or 37552 |
| 1. **Recursive Functions**   Stage 1 has 1 rhombus and 4 segments. Stage 2 has 5 rhombuses and 12  segments since 4 were drawn on the original sides. In Stage 3 there are 12  perimeter segments but because 8 are used in more than 1 rhombus, there are  only 8 new rhombuses drawn for a total of 13 and 20 segments. Continuing  in this manner, Stage 4 has 12 new rhombuses for a total of 25 and 28  segments. Stage 5 adds 16 for a total of 41 and has 36 segments and Stage 6  adds 20 for a total of 61 and 44 segments.  The sequence is 4, 12, 20, 28, 36, 44 … | **3.** 44 |
| 1. **Recursive Functions**   (12) = (10) - 3 = 11  (10) = (8) - 3 = 14  (8) = (6) + 4 = 17  (6) = (2) + 4 = 13  (2) = 9 Now substitute backwards. | **4.** 11 |
| **5. What Does This Program Do?**  The table contains the values of a, b, c, d, and e after each line.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | a | b | c | d | e | | 12 | 1 | 0 | 4 | 2 | | 8 | 1 | 0 | 4 | 2 | | 8 | 1 | 0 | 4 | 2 | | 8 | 1 | 0 | 4 | 4 | | 8 | 2 | 0 | 4 | 4 | | 8 | 2 | 0 | 0 | 4 |   (a + e) / b + (d + c) ↑ b \* c  = (8 + 4) / 2 + (0 + 0) ↑ 2 \* 0 = 12 / 2 + 02 \* 0 = 6 + 0 = 6 | **5.** 6 |