

Find the value/variable given in each problem in simplest form. You have 8 minutes to complete this test.

~~~~~ Good luck, and have fun! ~~~~~

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|-------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| _____ 1) $2022^2$                                                                                     | _____ 20) $111 \cdot 413$                                                                 |
| _____ 2) The number of positive integer factors of $2022^4$                                           | _____ 21) The area of the region bounded by $2 x  + 3 y  \leq 6$                          |
| _____ 3) $\frac{3}{1 + \frac{4}{1 + \frac{5}{9}}}$                                                    | _____ 22) 11 choose 4                                                                     |
| _____ 4) $f(2022)$ where $f(x) = 17x + 126$                                                           | _____ 23) $\sum_{n=0}^{360} \cos n^\circ$                                                 |
| _____ 5) $f^{-1}(1299)$ for $f(x)$ defined in 4)                                                      | _____ 24) $4\pi$ rounded to the nearest hundredth                                         |
| _____ 6) The number of edges in an octahedron                                                         | _____ 25) The number of distinct permutations of the letters in "UNDERTALE"               |
| _____ 7) $\frac{1}{2^1} + \frac{2}{2^2} + \frac{3}{2^3} + \frac{4}{2^4} + \dots$                      | _____ 26) $41 \times 32$                                                                  |
| _____ 8) Simplify: $\sqrt{252000}$                                                                    | _____ 27) The number of cents in 39 quarters, 12 dimes, 17 nickels, and 64 pennies        |
| _____ 9) $265^2$                                                                                      | _____ 28) $2^{2^2}$                                                                       |
| _____ 10) $1 \cdot 3 \cdot 5 \cdot 7 \cdot 9 \cdot 11$                                                | _____ 29) The sum of the squares of the solutions to $x^2 - 6x + 1 = 0$                   |
| _____ 11) $f(f(f(0.5)))$ where $f(x) = x(1 - x)$                                                      | _____ 30) $\frac{3}{11} - \frac{5}{23} + \frac{1}{2}$                                     |
| _____ 12) The first Fibonacci number greater than 1000                                                | _____ 31) The fifth hexagonal number                                                      |
| _____ 13) The abscissa ( $x$ -coordinate) of the slant asymptote of $y = \frac{2x^2 + 5x - 1}{x - 8}$ | _____ 32) The coefficient of the $x^2y^3z$ term in the expansion of $(2x - y + 3z + 1)^8$ |
| _____ 14) Simplify: $\sqrt{86 + 60\sqrt{2}}$                                                          | _____ 33) The average of the set $\{41, 63, 58, 22, 87\}$                                 |
| _____ 15) The radius of a sphere whose surface area is $\pi$ times its area                           | _____ 34) $39\frac{13}{19}$ as a common fraction                                          |
| _____ 16) $7^4$                                                                                       | _____ 35) $xy$ if $3x + 5y = 4$ and $7x - y = 3$                                          |
| _____ 17) The sum of the factors of 240.                                                              | _____ 36) $\frac{12!}{4!^3}$                                                              |
| _____ 18) $f(6)$ , where $f(f(x)) = 4x + 5$ and $f(0) > 0$                                            | _____ 37) The harmonic mean of $\{1, 2, 3, 4\}$                                           |
| _____ 19) Simplify: $\sqrt[3]{100 + 51\sqrt{3}}$                                                      | _____ 38) The sum of the first four prime numbers greater than 100                        |
|                                                                                                       | _____ 39) $43959 \bmod 70$                                                                |
|                                                                                                       | _____ 40) The last digit of $243!!$                                                       |