2012 TAMS Tournament

Number Sense

11.10.2012

This is a 10 minute, 80 question test. No scratch work or calculator is allowed. Correct answers are worth 5 points; incorrect answers are worth -9. Any questions skipped before the last answered question is counted wrong (i.e. you do 1-17, 20$\Longrightarrow$18,19 are counted wrong). The first answer written cannot be changed.

_____ 1: 11+10+2012

_____ 2: 11×10+2012

_____ 3: 11×2012

_____ 4: $2012 - 1110$

_____ 5: 2013/4 as a decimal

_____ 6: $\frac{15}{16}/\frac{2}{12}$

_____ 7: $5\left(5\frac{5}{6}\right)$ (as a mixed number)

_____ 8: 24% as a fraction

_____ 9: $5 + \frac{6-7\times8}{25}$

_____ 10: $\frac{3}{16}$ as a fraction

_____ 11: 2012+2013+2014

_____ 12: 11^4

_____ 13: 12^2

_____ 14: $13 \times 91 - 86 \times 13$

_____ 15: The GCD of 39 and 91

_____ 16: The median of {25, 56, 11, 21}

_____ 17: The larger of $\{-\frac{5}{18}, -\frac{2}{7}\}$

_____ 18: MDXV/V in Arabic Numerals

_____ 19: $1.08\overline{3} - 1.1\overline{6}$

_____ 20: $7^{-1} + 7^{-2}$

_____ 21: $30x$ if $12x = 37$

_____ 22: $37_9 + 64_9 = x_9$

_____ 23: $3x-2$ if $\{T, A, M, S\} \cup \{T, O, U, R, N, E, Y\}$ has x elements.

_____ 24: x as a mixed fraction if $\frac{3}{8} = \frac{x}{17}$

_____ 25: 129×131

_____ 26: The cost of 12 pens at 23 cents each.

_____ 27: $92 + 12.5\%$ of 56

_____ 28: $1 + 3 + 6 + 10 + 15 + 21$

_____ 29: $\lfloor\sqrt{2012}\rfloor$

_____ 30: 7^{x-1} if $7^x = 2093$

_____ 31: 69^2

_____ 32: A nonagon has how many more sides than a triangle?

_____ 33: $\sqrt{9801}$

_____ 34: $27^{5/3}$

_____ 35: $h+k$, (h, k) is the x-intercept of $5x-8y = 1$

_____ 36: 202^2

_____ 37: $111 \times 11 + 1111 \times 11$

_____ 38: A man is given 30 apples, 3 pears, 12 oranges and a kiwi. In the amount of time it takes the man to eat 5 apples, 1 page of homework can be done. For every 2 pages of homework that can be done, 27 cups of water are filled. Every time 3 cups of water are filled, a dog drinks one of the cups. After all the apples are eaten, how many cups of water are still full (not drunk by the dog)?

_____ 39: The larger of the 2 legs of a right triangle has length 24. If all sides of the triangle have integral length and the smaller leg has an odd length, how long is the hypotenuse of the triangle?

_____ 40: $26 \times 4! + 16 \times 3!$

_____ 41: $\frac{256}{0.25}$

_____ 42: 2^{10}

_____ 43: 3^5

_____ 44: 5^5

_____ 45: The smaller root of $8x^2 + 25x + 3 = 0$

_____ 46: The coefficient of x^2 in $(2x - 3)^3$

_____ 47: $f(g(-1))$ where $f(x) = 3x + 4$ and $g(x) = 2x^2 + 5x - 3$

_____ 48: 111×45

_____ 49: $\frac{1}{42} + \frac{1}{56} + \frac{1}{48}$

_____ 50: $\sin(30°) + \cos(30°)$

_____ 51: $15^2 \times 9^2 / 3^2$

_____ 52: The radius of the circle $4x^2 + 4y^2 = 256$

_____ 53: $55_6 + 5_6$ in base 6

_____ 54: x if $\sqrt{1 + \sqrt{2 + \sqrt{x}}} = 2$

_____ 55: The slope of the line $5x - 7y + 9 = 0$

_____ 56: $2^3 \times 5^3 \times 7^3$

_____ 57: $49 \times 2 + 49$

_____ 58: $17 \times (17/18) - 17$

_____ 59: The area of an isosceles right triangle with leg $3\sqrt{3}$

_____ 60: $8^3 \times 5^3$

_____ 61: $2 + 1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \cdots$

_____ 62: $\sin(2115^\circ)$

_____ 63: $\frac{4 \times 5! - 5 \times 4!}{4!}$

_____ 64: The number of two-element subsets of $\{R, O, B, E, R, T\}$

_____ 65: $\sin(x)$ if $\csc(x) = 1.125$

_____ 66: $a + b$ if $(2 - 7i)^2 = a + bi$

_____ 67: The number of non-empty subsets of $\{\mu, \alpha, \theta\}$

_____ 68: The length of the altitude to the hypotnuse of a right triangle with legs 5 and 12.

_____ 69: The fractional part of C that is A if A is $\frac{2}{3}$ of B, which is 60% of C.

_____ 70: x if $\log_5 x - \log_5 8 = 1$

_____ 71: $7^2 - 6^2 + 5^2 - 4^2 + 3^2 - 2^2 + 1^2$

_____ 72: How many ways can Daniel, David, Kevin, Chenyao, Alex, and Robert be split into tow unnamed teams of three?

_____ 73: $\lfloor 3 - 2\pi \rfloor$

_____ 74: $\sqrt{12544}$

_____ 75: 176 feet/second in miles/hour

_____ 76: The number of digits in the product $12094320945756490 \times 91243123345803294290$

_____ 77: 235×246 (to the nearest 5%)

_____ 78: $\sqrt{13579}$ (to the nearest 5%)

_____ 79: $125 \times \frac{37.5}{5/8}$ (to the nearest 5%)

_____ 80: $276\pi - 269e$ (to the nearest 5%)