

24) A particle moves in the direction of increasing x values, along the line $y = 63 - x$, starting from the point associated with $x = 0$, until it comes to a point on the line whose x coordinate is the first integer multiple of 13. Then it changes direction and moves on a line of slope 1, until it reaches a point where the x coordinate is the next integer multiple of 13. It then changes direction and moves on a line of slope -1 until it comes to a point where the x coordinate is the next integer multiple of 13. It then changes direction and moves on a line of slope 1 until it comes to a point where the x coordinate is the next integer multiple of 13. It then changes direction and moves on a line of slope -1 until it comes to a point where the x coordinate is the next integer multiple of 13. This pattern continues until the x coordinate is 2021, and the particle stops. What is the total distance traveled by the particle?

- a) 1414.21462 b) 1414.21014 c) 1414.21243 d) 1414.21356 e) 1414.21627 f) None of the above

25) Determine the number of points of intersection of the functions $f(x) = 43 \cos(17x - 21) + 10x$ and $g(x) = 21 \sin(14 - 13x) - 5x$.

- a) 33 b) 35 c) 32 d) 34 e) 36 f) None of the above

26) Let C_1 be the circle of radius 1 centered at the origin. 64 equally spaced points are placed on C_1 , with the first point $P_1 = (1, 0)$, and the other 63 points P_2, \dots, P_{64} ordered in such a way that they are placed in a counter clockwise fashion around the circle. Give the sum of the absolute values of the differences of the x and y coordinates for these 64 points.

- a) 57.57138 b) 57.57395 c) 57.57227 d) 57.57216 e) 57.57482 f) None of the above

27) **Tie Breaker:** Give the average of the selected answer values to problems 1-26. Use the value -1 for every selection of None of the above. The answer that is closest to the actual answer breaks the tie.

- a) 4792677.451
 b) 4792678.413
 c) 4792679.532
 d) 4792680.618
 e) 4792679.449
 f) 4792683.252
 g) 4792678.993
 h) 4792677.738
 i) 4792682.116
 j) 4792680.763
 k) 4792683.473
 l) 47926479.326
 m) 4792681.247
 n) 4792678.321
 o) 4792680.618
 p) None of the above