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Problem 4. Four identical tennis balls are packed, one on top of the other, tightly (but without changing their spherical shape) in a cylindrical can. What fraction of the volume of the can is outside the balls?

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Problem 5. Derek has in his pocket assorted coins (some combination of pennies, nickels, dimes, quarters, and fifty-cent pieces). What is the largest possible amount of money he can have without being able to make change for a nickel, a dime, a quarter, a fifty cent piece or a dollar?

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Problem 6. Justin, Miley, and Charice are among eight singers who will divided at random into two groups of four. What is the probability that all three end up in the same group?

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as x and y range over all real numbers?

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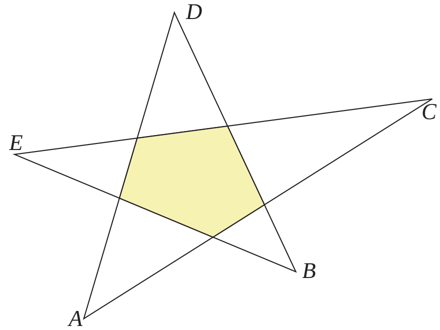
Problem 9. In radians, what is the sum $\angle A + \angle B + \angle C + \angle D + \angle E$ in the figure?



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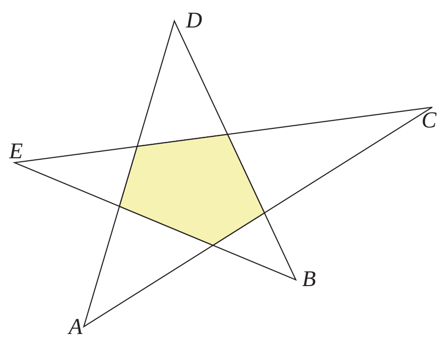

Problem 10. Given a set A of real numbers, define $A + A = \{a + b : a, b \in A\}$. For example, if $A = \{1, 4\}$, then $A + A = \{2, 5, 8\}$. If A consists of precisely *four* (different) numbers, what is the smallest number of elements in $A + A$?

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