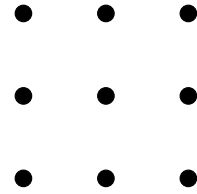


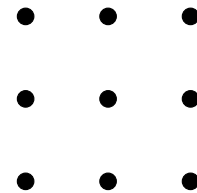
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Problem 4. How many 1s are in the base 2 expansion of the number whose base 8 expansion is 2017?

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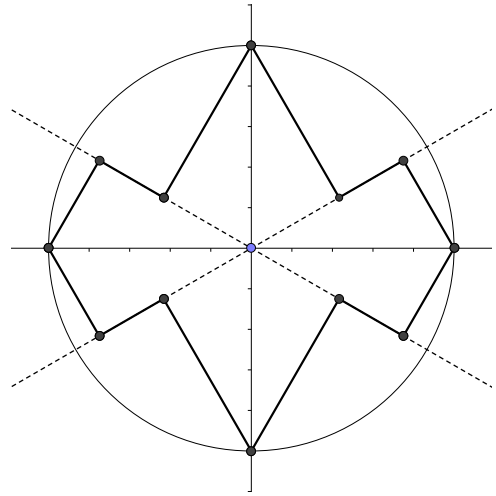
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Problem 9. If x and y are positive integers satisfying $\ln(x + y) = \ln(x) + \ln(y)$, what is $x^2 + y^2$?

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Problem 10. Start with a circle of radius 1 centered at $(0, 0)$. Draw two lines making an angle of 30° with the x -axis. Drop perpendiculars from these lines to the points $(\pm 1, 0)$ and $(0, \pm 1)$. Join the perpendiculars along the 30° lines to form a closed polygon.

What is the perimeter of this polygon?



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