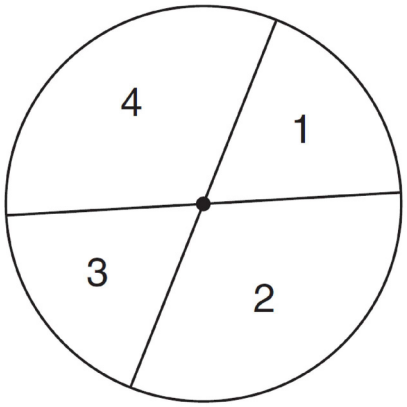
A2.S.13: Geometric Probability: Calculate theoretical probabilities, including geometric applications

1 A dartboard is shown in the diagram below. The two lines intersect at the center of the circle, and the central angle in sector 2 measures $\frac{2\pi}{3}$.



If darts thrown at this board are equally likely to land anywhere on the board, what is the probability that a dart that hits the board will land in either sector 1 or sector 3?

1) $\frac{1}{6}$

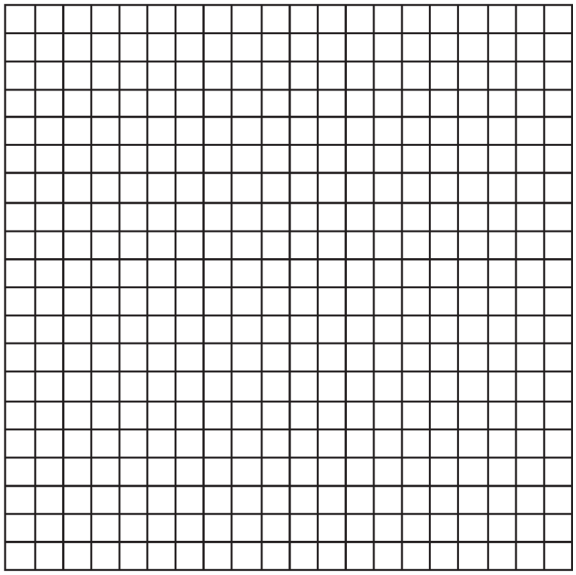
2) $\frac{1}{3}$

3) $\frac{1}{2}$

4) $\frac{2}{3}$

2 For a carnival game, John is painting two circles, *V* and *M*, on a square dartboard.

a On the accompanying grid, draw and label circle *V,* represented by the equation $x^2 + y^2 = 25$, and circle *M,* represented by the equation $(x-8)^2 + (y+6)^2 = 4$.



b A point, (x,y), is randomly selected such that $-10 \le x \le 10$ and $-10 \le y \le 10$. What is the probability that point (x,y) lies outside both circle *V* and circle *M*?

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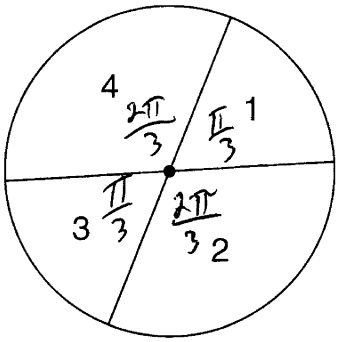
Answer Section

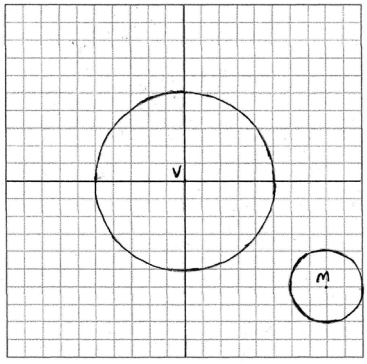
1 ANS: 2



$$\frac{\frac{\pi}{3}+\frac{\pi}{3}}{2\pi}=\frac{\frac{2\pi}{3}}{2\pi}=\frac{1}{3}$$

REF: 011108a2

2 ANS:



. 0.77. The dartboard is 20 x 20, with area of 400. $A = \pi r^2$, so the area of circle *V* is 25π and of circle *M* is 4π. The percentage of the area of the dartboard outside both circles is

$$\frac{400-(25\pi+4\pi)}{400}\cong 0.77$$

REF: 060334b