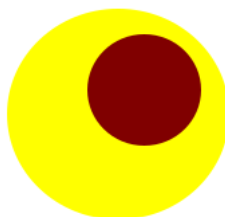


0.1 Mathematics of Chance

Worksheet 3

- 1) There are two circles in the picture. One is inside the other. Radius of the small circle is half of the radius of the big circle.

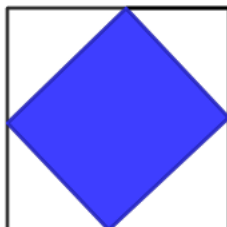


- a) If the radius of the small circle is r then what is the area of the small circle and big circle ?
- b) If a fine dot is placed into the figure, what is the probability of falling the dot in the small circle?
- c) What is the probability of falling the dot in the yellow shaded part in the figure.

Answers

- a) Area of small circle πr^2
Area of big circle $\pi \times (2r)^2 = 4\pi r^2$
- b) Probability of falling the dot in the small circle is $\frac{\pi r^2}{4\pi r^2} = \frac{1}{4}$
- c) Probability of falling the dot in the yellow shaded part is $1 - \frac{1}{4} = \frac{3}{4}$

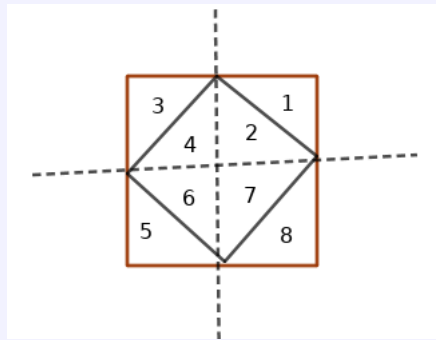
- 2) A square is drawn by joining the mid points of the sides of another square. The inner square is shaded blue.



- a) Divide the triangle into eight equal triangles by drawing two lines
- b) A fine dot is placed into the figure. What is the probability of falling the dot in the inner square?

Answers

a) Look at the picture



b) Among eight equal triangles, four of them determine the shaded square. $\frac{4}{8} = \frac{1}{2}$

3) A triangle is drawn by joining the alternate vertices of a regular hexagon.

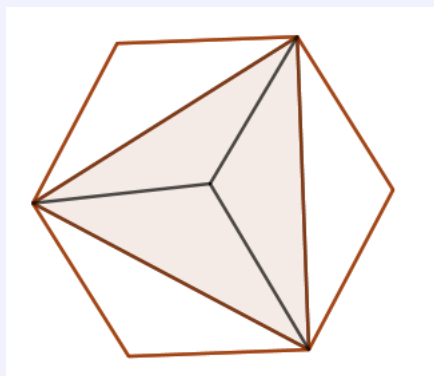


a) Divide the figure into 6 equal triangles

b) If a fine dot is placed into the figure, what is the probability of falling the dot in the shaded triangle?

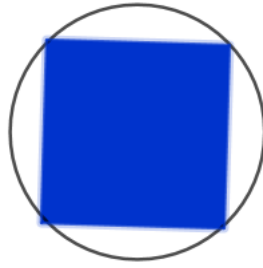
Answers

a) Figure



b) Among six equal triangles, three make the shaded triangle.
Probability = $\frac{3}{6} = \frac{1}{2}$

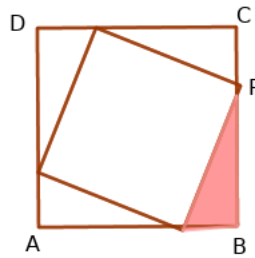
4) A square is drawn in a circle. The vertices of the square are on the circle. A fine dot is placed into the figure at random. What is the probability of falling the dot in the shaded square.



Answers

- ★ If one side of the square a the diagonal is $d = \sqrt{a^2 + a^2} = \sqrt{2}a$
Radius of the circle is $\frac{a\sqrt{2}}{2} = \frac{a}{\sqrt{2}}$
- ★ Area of the square a^2 , area of the circle $\pi \times \left(\frac{a}{\sqrt{2}}\right)^2 = \frac{\pi a^2}{2}$
- ★ Probability of falling the dot in the shade is $= a^2 \div \frac{\pi a^2}{2} = \frac{2}{\pi}$

- 5) There are two squares in the figure. The perimeter of the outer square is 28cm, the perimeter of the inner square is 20cm



- a) What is the area of the outer square?
- b) What is the area of inner square?
- c) What is the area of the shaded triangle ?
- d) If a fine dot is placed into the figure then what is the probability of falling the dot in the shaded triangle?

Answers

- a) One side of outer square $= \frac{28}{4} = 7\text{cm}$
Area $= 7^2 = 49\text{sq.cm}$
- b) One side of inner square $= \frac{20}{4} = 5\text{cm}$
Area $= 5^2 = 25\text{sq.cm}$
- c) Difference of the area of the triangles in between the squares is
 $49 - 25 = 24\text{sq.cm}$
Area of shaded part $= \frac{24}{4} = 6\text{sq.cm}$
- d) Probability $= \frac{6}{49}$