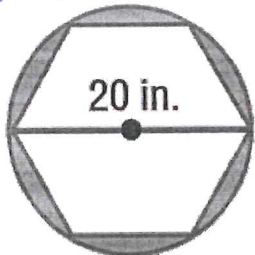


Geometric Probability HW#1

Find the area of both regions and then find the probability that a point chosen at random lies in the shaded region. Round your answers to the nearest tenth.

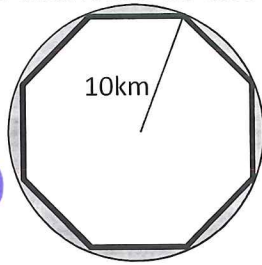
1. $r = 10$



20 in.

$A = O - \text{hexagon}$
 $= \pi 10^2 - 6\left(\frac{1}{2} \cdot 10 \cdot 10 \sin 60\right)$
 $= 100\pi - 259.8$
 $= 54.4$

2.



10km

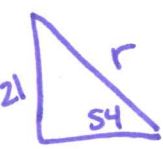
$A = O - \text{octagon}$
 $= \pi 10^2 - 8 \cdot \frac{1}{2} \cdot 10 \cdot 10 \sin 45$
 $= 100\pi - 282.8$
 $= 31.4$

$$\frac{\text{Area of shaded}}{\text{Area of Total}} = \frac{54.4}{(100\pi)} \approx \boxed{17.3\%}$$

$$\frac{\text{Area of shaded}}{\text{Area of Total}} = \frac{31.4}{(100\pi)} \approx \boxed{10\%}$$

$= 0.09969$

3.



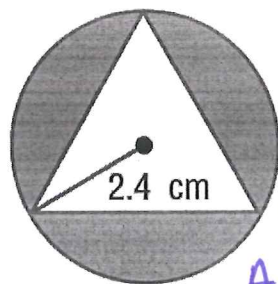
21

54

$\sin 54 = \frac{21}{r}$
 $r = 26.0$

$A = \text{pentagon} - O$
 $r = 26 \quad r = 21$
 $A = 5\left(\frac{1}{2} \cdot 26 \cdot 26 \sin 72\right) - \pi 21^2$
 $A = 1607.3 - 441\pi$
 $A = 221.9$

4.



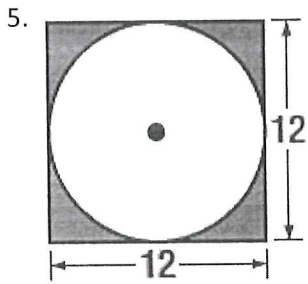
2.4 cm

$r = 2.4 \text{ cm}$
 $A = O - \Delta$
 $A = \pi 2.4^2 - 3\left(\frac{1}{2} \cdot 2.4^2 \sin 60\right)$
 $A = 5.8\pi - 7.5$
 $A = 10.7$

$$\frac{\text{Area of shaded}}{\text{Area of Total}} = \frac{221.9}{1607.3} \approx \boxed{13.8\%}$$

$$\frac{\text{Area of shaded}}{\text{Area of Total}} = \frac{10.7}{(5.8\pi)} \approx \boxed{58.7\%}$$

□ - ○



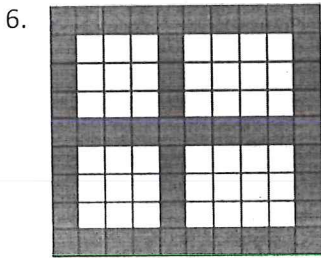
Shaded: $(12)(12) - \pi 6^2$

$$A = 144 - 36\pi$$

$$A = 30.9$$

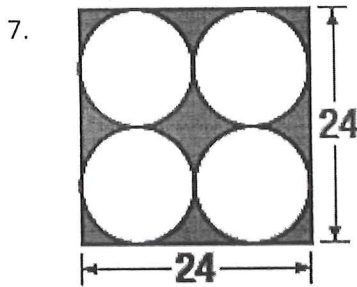
$$\frac{\text{Area of shaded}}{\text{Area of Total}} = \frac{30.9}{144}$$

$$\approx 21.5\%$$



Count the squares!

$$\frac{\text{Area of shaded}}{\text{Area of Total}} = \frac{48}{90} \approx 53.3\%$$



$$A = \square - 40$$

$$A = (24)(24) - 4\pi 6^2$$

$$A = 576 - 144\pi$$

$$A = 123.6$$

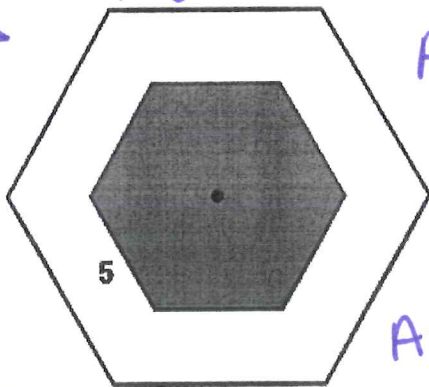
$$\frac{\text{Area of shaded}}{\text{Area of Total}} = \frac{123.6}{576}$$

$$\approx 21.5\%$$



$$\cos 60 = \frac{4}{r}$$

$$r = 8$$



$$A = \text{Little } r = 5$$

$$= 6\left(\frac{1}{2} \cdot 5 \cdot 5 \sin 60\right)$$

$$= 65.0$$

$$A = \text{Big } r = 8$$

$$= 6\left(\frac{1}{2} \cdot 8 \cdot 8 \sin 60\right)$$

$$= 166.3$$

$$\frac{\text{Area of shaded}}{\text{Area of Total}} = \frac{65}{166.3}$$

$$\approx 39.1\%$$



$$\cos 60 = \frac{2.5}{r}$$

$$r = 5$$