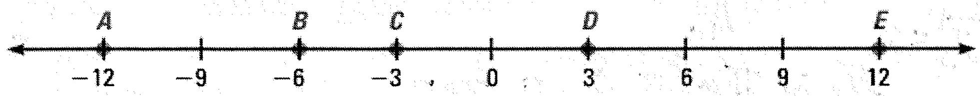
Geometry
Chapter 11.7: Geometric Probability Worksheet

Name: Answer Key

In exercises 1-5, find the probability that a point K, selected on $\overline{BE}$, is on the given segment. Express your answer as a simplified fraction, decimal and percent (Round to the nearest tenth).

$BE = 18$



1. $\overline{BD}$

$P(\overline{BD}) = \frac{9}{18} = \frac{1}{2}$

$\boxed{\frac{1}{2}, .5, 50\%}$

2. $\overline{BC}$

$P(\overline{BC}) = \frac{3}{18} = \frac{1}{6}$

$\boxed{\frac{1}{6}, .16\overline{6}, 16.7\%}$

3. $\overline{CE}$

$P(\overline{CE}) = \frac{15}{18} = \frac{5}{6}$

$\boxed{\frac{5}{6}, .8\overline{3}, 83.3\%}$

4. $\overline{BE}$

$P(\overline{BE}) = \frac{18}{18} = 1$

$\boxed{1, 1.0, 100\%}$

5. $\overline{AB}$

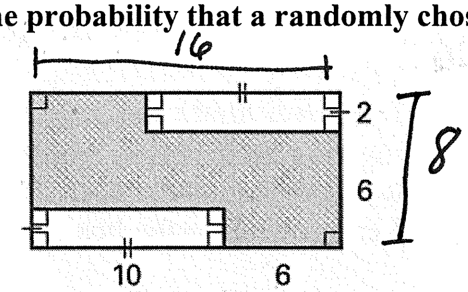
$P(\overline{AB}) = \frac{0}{18}$

$P(\overline{AB}) = 0\%$

0.0

Find the probability that a randomly chosen point in the figure lies in the <u>shaded region</u>.

6.



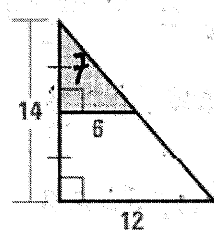
$P(\text{shaded}) = \frac{A_{whole} - 2A_{little\,\square}}{A_{whole}}$

$\frac{11}{16}$

$P(\text{shaded}) = \frac{16 \cdot 8 - 2(10 \cdot 2)}{16 \cdot 8} = \frac{88}{128} = .6875$

$\boxed{68.8\%}$

7.



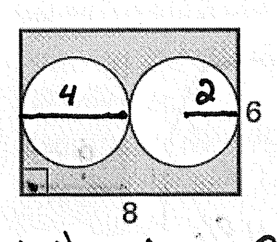
$P(\text{shaded}) = \frac{A_{little}}{A_{big\,\Delta}}$

$= \frac{\frac{7 \cdot 6}{2}}{\frac{14 \cdot 12}{2}}$

$= \frac{21}{84} = .25$

$\frac{1}{4}, 25\%$

8.

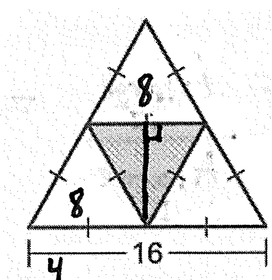


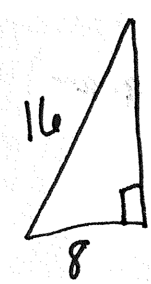
$P(\text{shaded}) = \frac{A_{\square} - 2(A_{\circ})}{A_{\square}}$

$= \frac{8 \cdot 6 - 2(\pi 2^2)}{8 \cdot 6}$

$P(\text{shad}) = .476 = \boxed{47.6\%}$

9.





$8^2 + h^2 = 16^2$

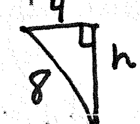
$-64 \qquad -64$

$\sqrt{h^2} = \sqrt{192}$

$h \approx 13.86$

$A_{large} = \frac{16(13.86)}{2}$

$A_{large} = 110.88$



$4^2 + h^2 = 8^2$

$-16 \qquad -16$

$\sqrt{h^2} = \sqrt{48}$

$h \approx 6.93$

$A_{small} = \frac{6.93(8)}{2}$

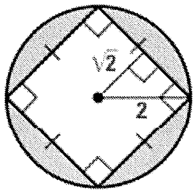
$A_{small} = 27.72$

$P(\text{shaded}) = \frac{27.72}{110.88} = .25$

$\boxed{25\%}$

10.

$\frac{360}{4} = 90$

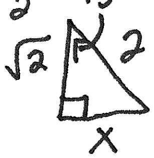


$A(\text{shaded}) = A_\circ - A_\square$

$P(\text{shaded}) = \frac{A(\text{shaded})}{A_\circ}$

$A_\square = (2\sqrt{2})(2\sqrt{2}) = 8$

$\frac{90}{2} = 45$



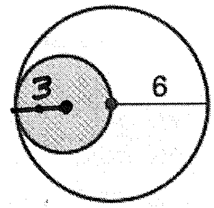
$x = \sqrt{2}$

$\text{side} = 2\sqrt{2}$

$P(\text{shad}) = \frac{\pi 2^2 - 8}{\pi 2^2} = .363$

$\boxed{36.3\%}$

11.



$P(\text{shaded}) = \frac{A_{small}}{A_{large}}$

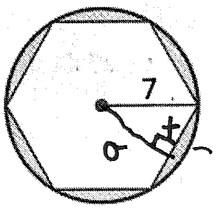
$= \frac{\pi 3^2}{\pi 6^2} = \frac{9}{36}$

$P(\text{shaded}) = \frac{1}{4}$

25%

.25

12.



$P(\text{shaded}) = \frac{A_\circ - A_{hex}}{A_\circ} = \frac{\pi 7^2 - 127.26}{\pi 7^2} = .173$

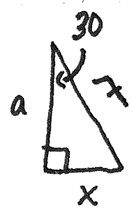
17.3%

$P = 6 \cdot 7$

$P = 42$

$a = 6.06$

$A_{hex} = \frac{42(6.06)}{2} = 127.26$



$\frac{\cos 30}{1} = \frac{a}{7}$

$7\cos 30 = a$

$6.06 = a$

$\frac{\sin 30}{1} = \frac{x}{7}$

$7\sin 30 = x$

$3.5 = x$

$3.5(2) = 7 = \text{side}$

13. A point X is chosen at random in region U, and U includes region A. What is the probability that X lies in U, but does not lie in A?

Ⓐ $\frac{\text{Area of } A}{\text{Area of } U}$

Ⓑ $\frac{\text{Area of } A}{\text{Area of } U - \text{Area of } A}$

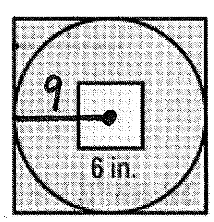
Ⓒ $\frac{1}{\text{Area of } A}$

● $\frac{\text{Area of } U - \text{Area of } A}{\text{Area of } U}$

14a. A dart is thrown and hits the target shown. If the dart is equally likely to hit any point on the target, what is the probability that it hits inside the inner square?

$P(\text{inner square}) = \frac{A_{\text{small }\square}}{A_{\text{large }\square}} = \frac{6^2}{18^2} = \frac{36}{324} = \boxed{\frac{1}{9}}$

.11 11%



18 in.

14b. If the dart is equally likely to hit any point on the target, what is the probability that is hits outside the inner square, but inside the circle?

$P\left(\begin{matrix}\text{inside circle}\\ \text{outside small }\square\end{matrix}\right) = \frac{A_\circ - A_{\text{small }\square}}{A_{\text{large }\square}} = \frac{\pi 9^2 - 6^2}{18^2} = \frac{218.469}{324} = .674$

$\boxed{67.4\%}$