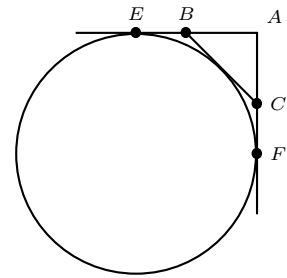
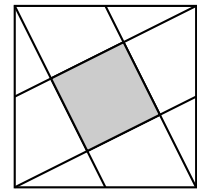


9. In the diagram, a circle is tangent to the hypotenuse of the isosceles right triangle ABC . Side AB is extended and is tangent to the circle at E . Side AC is extended and is tangent to the circle at F . If the area of triangle ABC is 9, then the area of the circle is:



- (a) $9\pi(3 - 2\sqrt{2})$ (b) $9\sqrt{2}\pi$ (c) $9\pi(3 + 2\sqrt{2})$
 (d) $18\sqrt{2}\pi$ (e) 36π

10. In the diagram at the right, segments join the vertices of a square with area 1 to midpoints of its sides. The area of the shaded quadrilateral is:

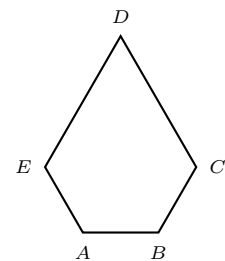


- (a) $\frac{1}{2}$ (b) $\frac{2}{5}$ (c) $\frac{1}{3}$
 (d) $\frac{1}{4}$ (e) $\frac{1}{5}$

11. The longer base of a trapezoid has length 15 and the line segment joining the midpoints of the two diagonals has length 3. The length of the shorter base of the trapezoid is:

- (a) 6 (b) $\frac{15}{2}$ (c) 9 (d) 10 (e) 12

12. In the diagram at the right, $\angle A = \angle B = 120^\circ$, $EA = AB = BC = 2$, and $CD = DE = 4$. The area of the pentagon $ABCDE$ is:



- (a) $7\sqrt{3}$ (b) $9\sqrt{3}$ (c) $3 + 6\sqrt{3}$
 (d) 12 (e) $6\sqrt{5}$

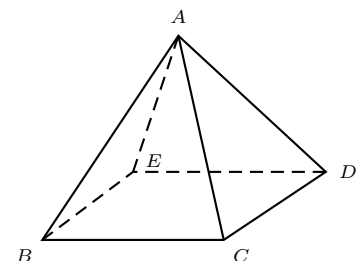
13. Each of 600 people have at most twenty \$5 bills, some may have none. Divide the 600 into groups of people with the same number of \$5 bills. The smallest possible maximum size of any of these groups is:

- (a) 26 (b) 27 (c) 28 (d) 29 (e) 30

14. Consider the positive integers whose first digit is 1 and which have the property that if this digit is transferred to the end of the number, the resulting number is exactly 3 times as large as the original. For example, 139 would be transformed into 391, which is not exactly 3 times as large as 139. If N is the smallest such positive integer, then the remainder when N is divided by 9 is:

- (a) 0 (b) 3 (c) 4 (d) 5 (e) 8

15. The pyramid $ABCDE$ has a square base and all four triangular faces are equilateral. The measure of the angle ABD is:



- (a) 30° (b) 45° (c) 60°
 (d) 75° (e) 90°