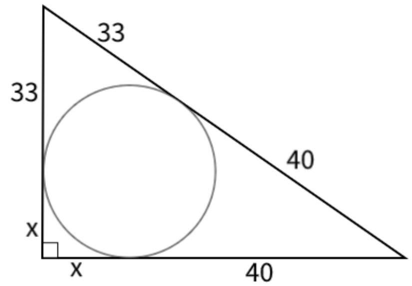
1. A If the side length of the large square 8x, then the smaller square has side length $x\sqrt{34}$. The area of the larger square can be written as $64x^2$ and the area of the smaller square as $34x^2$. Since the difference in area is 15, x^2 is ½ and plugging that in for the area of the smaller square results in **17**.
2. B A regular polygon with **36** sides has interior angles of 170°.
3. C 360 is not divisible by **16**.
4. D Triangles LAW and LSN cover half of SWAN, so the area of SWAN is 54 square feet or **6** square yards.
5. E Edward's giraffe can roam ¾ $(20^2\pi)$ + ¼ $(4^2\pi)$ + ¼ $(8^2\pi)$, which simplifies to $\mathbf{320\pi}$.
6. D The area of the hexagon is $96\sqrt{3}$ and the area of the square is 96 (the diameter of the circle is the diagonal of the square), so the ratio is $\frac{96\sqrt{3}}{96}$ or $\mathbf{\sqrt{3}}$.
7. E First, graph the points to find how the points connect together to form a polygon (the points aren't in order). Then, use the Shoelace Formula with the correct order of the points to find the area: **385/2**.
8. B If TP is 28x, then PA is 5x. CAP and CAT are both right triangles, so by setting up equations with the information given, x is found to be 4. Then x can be plugged into one of the equations to find the second side of one of the two right triangles. Finally, CA is found to be **99**.
9. A The equation of circle O is $(x+6)^2+(y-3)^2=37$, so the center and radius of the circle is (-6, 3) and $\sqrt{37}$, respectively. The distance between the center of circle O and point (5, 7) is $\sqrt{137}$. By using the Pythagorean Theorem, the tangent segment is found to be **10** units long.
10. D $JN=Y, JA=X, SO=Z, ON=W \rightarrow m\angle O+m\angle J=\frac{X+Y+80}{2}+\frac{W+Z+80}{2}=\frac{360+80}{2}=220$
11. C The semiperimeter is $\frac{19}{2}+\frac{3\sqrt{5}}{2}$, so by using Heron's Formula, the area is $\sqrt{(\frac{19}{2}+\frac{3\sqrt{5}}{2})(\frac{19}{2}-\frac{3\sqrt{5}}{2})(\frac{3\sqrt{5}}{2}+\frac{5}{2})(\frac{3\sqrt{5}}{2}-\frac{5}{2})}=\sqrt{(\frac{361-45}{4})(\frac{45-25}{4})}=\sqrt{(79)(5)}=\mathbf{\sqrt{395}}$.
12. D The square is 36 square inches and the two semicircles have a combined area of 9π square inches, resulting in an overall area of **36 + 9π** square inches.
13. E The triangle is $4\sqrt{3}$ square inches and the two semicircles have a combined area of π square inches, resulting in an overall area of $\mathbf{4\sqrt{3}+\pi}$ square inches.
14. A A hendecagon has 11 sides, so the sum of interior angles is $10\times 180°=\mathbf{1800°}$.
15. C All statements except the second statement are true (**3**).
16. B Only the first and second statements are true (**2**).
17. A The radii of Dora and Gloria can form two sides of a right triangle (7-24-25). The last side is half of the chord. So, the length of the chord is **48**.
18. A Let the third tangent be perpendicular to the line that connects point L and the center of circle A. Using similar triangles, the legs of the isosceles triangle is found to be 5 and the base to be 6. The perimeter is then **16**.

19. C An octagon has **20** diagonals.

20. C Draw a line parallel to the external tangent from the center of the smaller circle to the radius of the bigger circle that is perpendicular to the tangent. A 13-84-85 right triangle is then formed, so the length of the external tangent is **84**.

21. C After using the Pythagorean Theorem to solve for x (x = 15), we get that the triangle is a 48-55-73 right triangle, so the area is **1320**.



22. D Let $UD = x$ and $UN = x + 7$. Using the power of a point theorem, we know that $15x = 10(x + 7) = 10x + 70$. After solving for x, we get $x = 14$. $MD = MU + UD = 15 + 14 = \mathbf{29}$.

23. B The maximum area of an inscribed rectangle in a triangle is the half of the triangle's area. The area of the triangle is 60, so the maximum area of the rectangle is **30**.

24. A We can say that the diagonal of the square is all the circles' diameters combined (as the circles get infinitely smaller, more and more of the diagonal is being included to the line of diameters), so the sum of the circumferences is $\boldsymbol{4\pi\sqrt{2}}$.

25. D The radius of the incircle (r) can be found by dividing the area by the semiperimeter. By using Heron's formula, we get that the area is $3\sqrt{15}$. The semiperimeter is 9, so $r = \frac{3\sqrt{15}}{9} = \frac{\sqrt{15}}{3}$. The area of the incircle is then $(\frac{\sqrt{15}}{3})^2\pi = \frac{15\pi}{9} = \boldsymbol{\frac{5\pi}{3}}$.

26. A Draw a line from a vertex from F that is perpendicular to the side of the triangle. This forms a 30°-60°-90° triangle, with the hypotenuse having a length of 5, so the shorter leg that is part of the side of the triangle is $\frac{5}{2}$. Since the same is for the other side, the side length of the triangle is $\frac{5}{2} + 10 + \frac{5}{2} = 15$. The area is then $\boldsymbol{\frac{225\sqrt{3}}{4}}$.

27. A Draw two lines from one of the centers to the two points of intersection. Do the same for the other center and then draw another line connecting the centers. Add the areas of the equilateral triangles and circle segments together to get $\boldsymbol{96\pi - 72\sqrt{3}}$.

28. A Draw a picture. Call angles DAC and ADC "x". Therefore angle DCA is 180-2x. Call angle DAB "y". Angle ADB is 180-x so angle B is "x-y". Based on the information given :(x+y)-(x-y)=30, then y=15

29. A Connect the three centers to form an equilateral triangle with side lengths of 6. The area in the middle can be found by subtracting the three circle sectors from the triangle. The triangle has area $9\sqrt{3}$ and each sector has area $\frac{9\pi}{6}$, so the area in the middle is $\boldsymbol{9\sqrt{3} - \frac{9\pi}{2}}$.

30. B Opposite angles of a cyclic quadrilateral have a sum of **180°**.