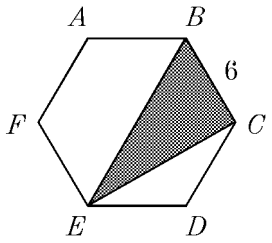
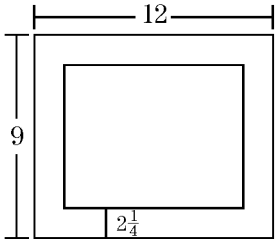
Name _____ Date _____

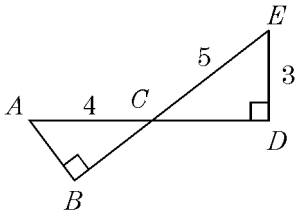
1. Find the area of the shaded region if $ABCDEF$ is a regular hexagon and $BC = 6$.



2. A rectangular mat measures 9 inches by 12 inches around the outside. The mat forms a $2\frac{1}{4}$ inch border around the sides of the picture as shown. What is the number of square inches in the area of the visible portion of a picture inside the mat? Give your answer as a mixed number.

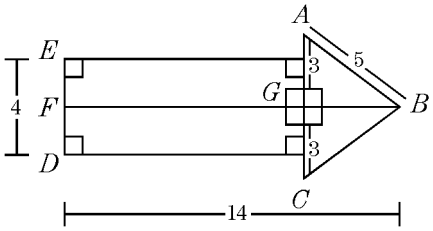


3. In the figure shown, $AC = 4$, $CE = 5$, $DE = 3$, and angle ABC and angle CDE are right angles. Find the number of square units in the area of triangle ABC. Express your answer as a common fraction.

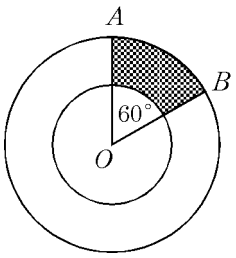


4. The area of a rhombus is 840 square inches. The length of one of its diagonals is 40 inches. Find the number of inches in the perimeter of the rhombus.

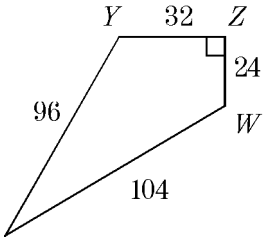
5. In the diagram, $GC = AG = 3$, $ED = 4$, $BF = 14$, and $AB = 5$. What is the number of square units in the area of the region covered by the arrow?



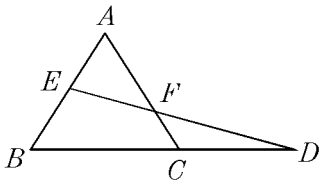
6. Point O is the center of the two circles in the diagram, the measure of angle AOB is $60°$, and the length of the radius of the larger circle is twice the length of the radius of the smaller one. If the area of the shaded region is $\frac{9\pi}{8}$ square units, what is the number of square units in the area of the smaller circle? Express the answer in terms of π.



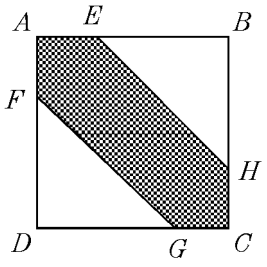
7. What is the area in square units of the quadrilateral $XYZW$ shown?



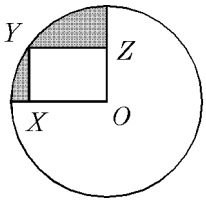
8. ABC is an equilateral triangle with sides equal to 2 cm. $\overline{BC}$ is extended its own length to D, and E is the midpoint of $\overline{AB}$. $\overline{ED}$ meets $\overline{AC}$ at F. Find the area of the quadrilateral $BEFC$ in square centimeters in simplest radical form.



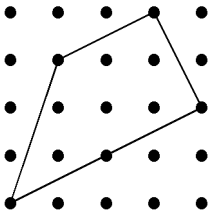
9. $ABCD$ is a square and $AE = AF = CG = CH$. Given $AB = 5$ and the shaded region is five-ninths of the area of $ABCD$, find AF. Express your answer as a common fraction.



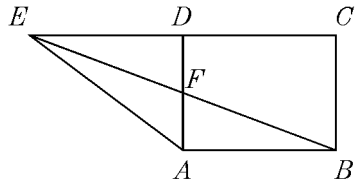
10. In the figure $XO = 8$, $ZO = 6$, and the vertex Y of rectangle $XYZO$ lies on circle O. Find the area of the shaded region. Express your answer in terms of π.



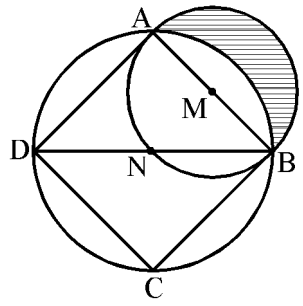
11. The centers of the dots shown are 1 cm apart both vertically and horizontally. Find the number of centimeters in the perimeter of the polygon. Express your answer as a decimal to the nearest hundredth.



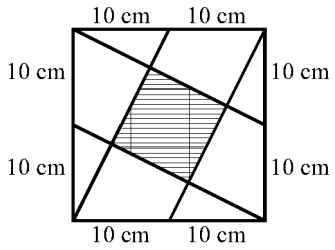
12. In the diagram, D is the midpoint of $\overline{EC}$, and the area of $\triangle$EDF is 4 square centimeters. What is the number of square centimeters in the area of rectangle ABCD?



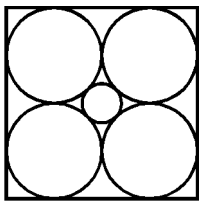
13. Circle M intersects circle N at A and B. $ABCD$ is a square, and $BD = 4$ cm. How many square centimeters are in the area of the shaded region?



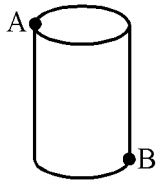
14. What is the number of square centimeters in the area of the shaded region?



15. Four circles, each with radius 4 cm, are tangent to each other and tangent to an external square. A smaller circle is drawn tangent to each of the larger circles as shown. What is the number of square centimeters in the area of the smaller circle? Express your answer as a decimal to the nearest tenth.

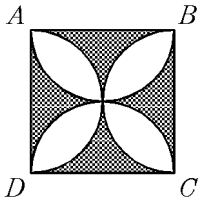


16. An ant at a picnic is crawling up the side of a can. The can is 8 in. tall and has a diameter of $3\frac{3}{4}$ in. The ant is at point A on the rim of the top of the can, and she has decided to return to point B at the bottom of the can on the exact opposite side. How many inches are in the shortest path she can travel from A to B? Express your answer as a decimal to the nearest tenth.

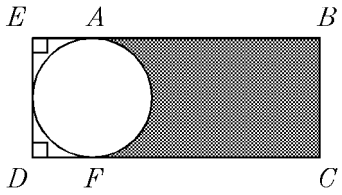


17. A circle is inscribed in a semicircle as shown. The diameter of the circle and the radius of the semi-circle are both 12 inches. What is the number of square inches in the area of the shaded region? Express your answer in terms of π.

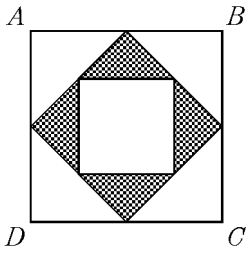
18. Semicircles whose centers are the midpoints of the sides of square $ABCD$ are drawn. If the measure of each side of the square is 4 cm, what is the area, to the nearest tenth of a square centimeter, of the shaded portion of the figure?



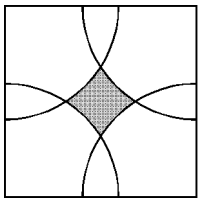
19. In rectangle $EBCD$, $AB = 10$ and $BC = 8$. The circle shown is tangent to three sides of the rectangle. Find the number of square units in the area of the shaded region. Express your answer in terms of π.



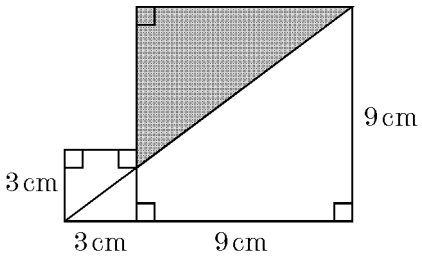
20. $ABCD$ is a square 4 inches on a side, and each of the inside squares is formed by joining the midpoints of the outer square's sides. What is the area of the shaded region?



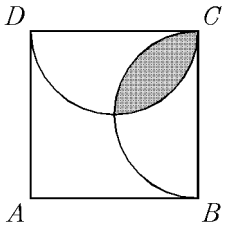
21. The vertices of a square are the centers of four circles as shown. Given each side of the square is 6 cm and the radius of each circle is $2\sqrt{3}$ cm, find the area in square centimeters of the shaded region.



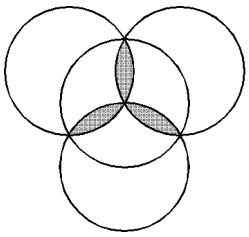
22. What is the area of the shaded region in the figure shown? Round your answer to the nearest square centimeter.



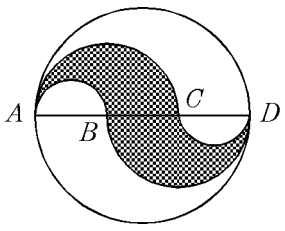
23. $ABCD$ is a square with $AB = 8\,\text{cm}$. $\overline{BC}$ and $\overline{CD}$ are semicircles. Express the area of the shaded region, in square centimeters, in terms of π.



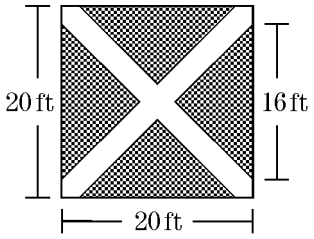
24. Each of the circles shown has a radius of 6 cm. The three outer circles have centers that are equally spaced on the original circle. Find the area, in square centimeters, of the shaded region. Round your answer to the nearest square centimeter. Use 3.14 for π.



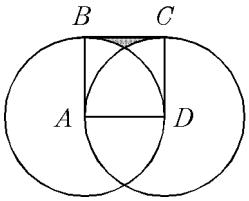
25. In the figure, arcs AB, AC, BD, and CD are semicircles. If segments AB, BC, and CD have length 4, how many square units are in the shaded area? Express your answer in terms of π.



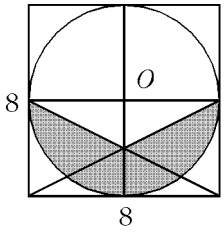
26. A garden is laid out in the fashion shown in the diagram. If only the shaded isosceles triangles are used for planting, what is the total area, in square feet, that is to be used for planting?



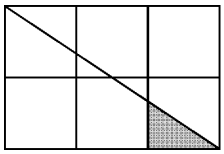
27. Circles A and D of radius 10 inches intersect in such a way that their centers are 10 inches apart. What is the area of the shaded region of square $ABCD$? Express your answer in square inches to the nearest hundredth.



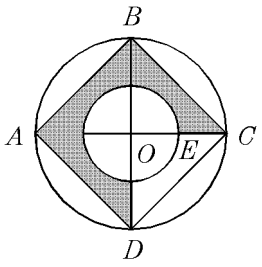
28. The circle is inscribed in a square with sides 8 cm. What is the area of the shaded part in square centimeters? Express your answer in terms of π.



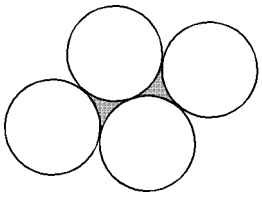
29. How many square units are in the shaded triangle shown on the 3 by 2 grid of unit squares? Express your answer as a common fraction.



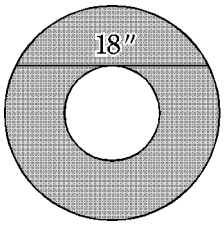
30. In the diagram, both circles have center O, $\overline{AC}$ and $\overline{BC}$ are diameters of the larger circle, $\overline{AC} \perp \overline{BD}$, $AO = 2$, and $OE = 1$. Find the area of the shaded region. Express your answer as a common fraction in terms of π.



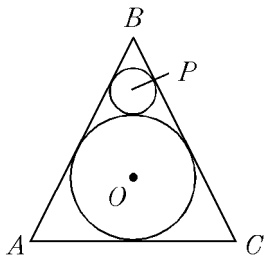
31. An infinite plane is completely filled with congruent circles in the pattern shown. What percentage of the plane is covered by the circles? Round your answer to the nearest percent.



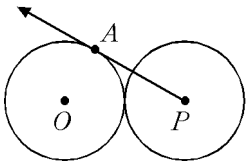
32. A chord of the larger of two concentric circles is tangent to the smaller circle and measures $18''$. Find the number of square inches in the area of the shaded region. Express your answer in terms of π.



33. Circle O of radius 20 is inscribed in equilateral triangle ABC. Circle P is tangent to circle O and segments $\overline{AB}$ and $\overline{BC}$. Find the radius of circle P. Express your answer as a mixed number.

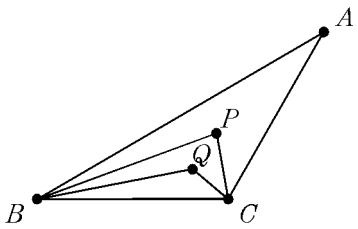


34. Congruent circles O and P are tangent, and ray PA is tangent to circle O at A as shown. If the length of segment AP is 15, what is the length of the radius of circle P?

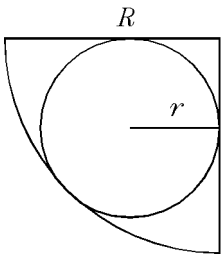


35. The sum of the areas of two circles with integral radii is 202π. What is the radius of the larger circle?

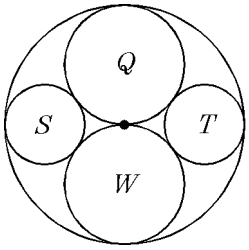
36. The trisectors of 2 angles of a scalene triangle ABC meet at points P and Q as shown. The third angle of the triangle, A, is 30 degrees. Find the measure in degrees of angle BPC.



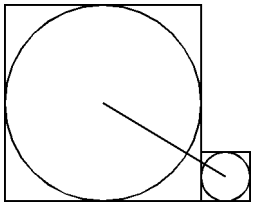
37. A circle is inscribed in a quarter-circle. Express in simplest radical form the radius r of the circle in terms of the radius R of the quarter-circle.



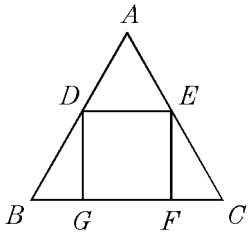
38. In the diagram, circle Q is congruent to circle W, and both are tangent to circle O and to each other. Circle S and circle T are congruent and are tangent to circle O, to circle Q and to circle W. Find the ratio of the area of the smallest circle to the largest circle.



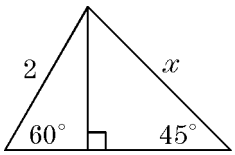
39. The areas of two adjacent squares are 256 square inches and 16 square inches, respectively, and their bases lie on the same line. What is the number of inches in the length of the segment that joins the centers of the two inscribed circles? Express your answer as a decimal to the nearest tenth.



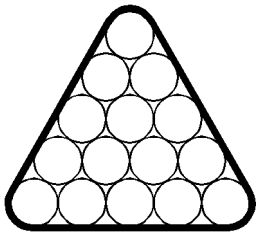
40. $\triangle ABC$ is an equilateral triangle, and $DEFG$ is a square of side 6 inches. Find the length, in inches, of a side of $\triangle ABC$.



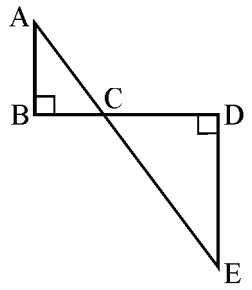
41. What is the value of x in the diagram?



42. Fifteen balls of diameter 2.25 inches are put together to form the "triangle" shown. What is the minimum length, in inches, of metal band required to enclose the balls? Express your answer in terms of π.

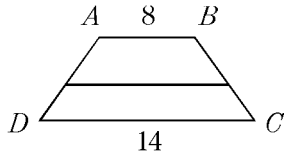


43. In the diagram $BD = 6\,\text{km}$, $AB = 3\,\text{km}$, and $DE = 5\,\text{km}$. What is the number of kilometers in AE?



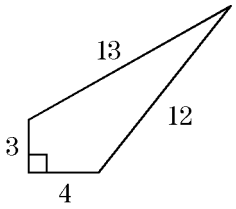
44. $\triangle ABC \sim \triangle ADB$, $AC = 4\,\text{cm}$, and $AD = 9\,\text{cm}$. What is the number of centimeters in the length of $\overline{AB}$?

45. The sides of an isosceles trapezoid are given as: $AB = 8\,\text{cm}$, $CD = 14\,\text{cm}$, and $BC = AD = 5\,\text{cm}$.



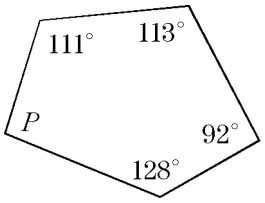
If a trapezoid strip 1 cm wide is cut off the bottom of the trapezoid as shown, then what is the number of centimeters in the perimeter of the strip?

46. If a convex quadrilateral has sides of lengths 3, 4, 12, and 13 and the two shorter sides are perpendicular to one another as shown, what is the area of the quadrilateral?

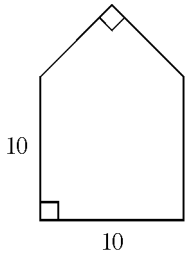


47. The ratio of the length of a rectangle to its width is the same as that of the diagonal to the length. If the width is 2, how many units are in the length of the diagonal?

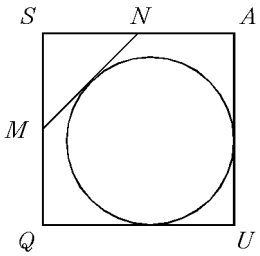
48. How many degrees are there in the measure of angle P?



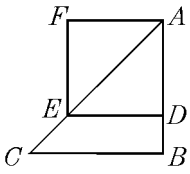
49. In softball, the home plate is a pentagon with three right angles, as shown, and the other two angles congruent. What is the longest distance between any two vertices of this pentagon? Express the answer as a decimal to the nearest hundredths.



50. Square $SQUA$ with midpoints M and N of sides $\overline{SQ}$ and $\overline{SA}$, respectively, has an area of 64 square units. What is the number of square units, rounded to the nearest integer, in the area of the largest circle which can be drawn in pentagon $MNAUQ$?



51. In the diagram, $\triangle ABC$ is an isosceles right triangle that overlaps square ADEF. $EF = 4$ and $AC = 8$. What is the ratio of the area of quadrilateral EDBC to the area of pentagon AFECB? Express your answer as a common fraction.



52. Point A has coordinates $(-2, 1)$. Point B is the image of A reflected in the line $y = 3$. Point C is the image of B reflected in the line $y = x + 3$. Point D is the image of C reflected in the line $x = 0$. What is the distance between A and D?

53. A particular translation $(x, y) \rightarrow (x', y')$ is defined by:

$$x' = x + 4$$
$$y' = y - 5$$

A particular reflection is defined by:

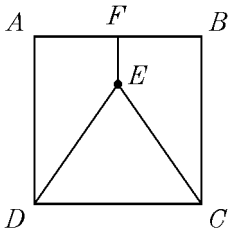
$$x' = -x$$
$$y' = y$$

Find the distance between $(4, 3)$ and its image after being first translated and then reflected a designated above.

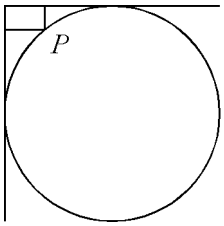
54. P and Q are reflections of $(2, -3)$ across the x-axis and the y-axis, respectively. Find the length of $\overline{PQ}$ in simplest radical form.

55. What is the area of a quadrilateral whose consecutive vertices have coordinates $(1, 1)$, $(1, 6)$, $(5, 6)$, and $(12, 2)$?

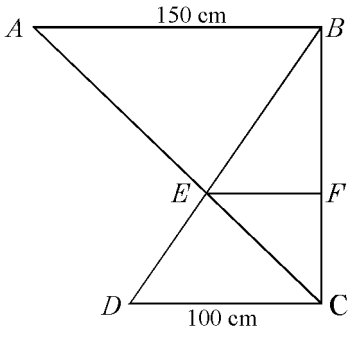
56. $ABCD$ is a square and $\triangle DCE$ is an equilateral triangle. Given $FE = 1$ and $\overline{FE} \parallel \overline{AD}$, find DC. Express your answer in simplest radical form.



57. A circular table is pushed into the corner of a square room so that a point P on the edge of the table is $8''$ from one wall and $9''$ from the other wall as shown. Find the radius of the table in inches.



58. What is the number of centimeters in the length of $\overline{EF}$ if $\overline{AB} \parallel \overline{CD} \parallel \overline{EF}$?



59. A glide reflection is described by moving points up 3 units and then reflecting the points in the y-axis. What is the image of the point $(4, 2)$ under this glide reflection?

60. A glide reflection moves all points up 1 unit and to the left 3 units. Points are then reflected in the x-axis. This glide reflection can be said to map a general point (x, y) to ____.

4/24/2006

Answer List

1. $18\sqrt{3}$ (units^2)
2. $33\frac{3}{4}$ (units^2)
3. $\frac{96}{25}$ (units^2)
4. 116 (in.)
5. 52 (units^2)
6. $\frac{9\pi}{4}$ (units^2)
7. 2304 (units^2)
8. $\frac{2}{3}\sqrt{3}$ (cm^2)
9. $\frac{5}{3}$ (units)
10. $25\pi - 48$ (units^2)
11. 12.11 (cm)
12. 16 (square centimeters)
13. 2 (square centimeters)
14. 80 (square centimeters)
15. 8.6 (square centimeters)
16. 9.9 (inches)
17. 36π (square inches)
18. 6.9 (cm^2)
19. $(80 - 8\pi)$ (units^2)
20. 4 (in^2)
21. $36 - 12\sqrt{3} - 4\pi$ (cm^2)
22. 30 (cm^2)
23. $8\pi - 16$ (cm^2)
24. 20 (cm^2)
25. 12π (units^2)
26. 256 (ft^2)
27. 4.34 (in^2)
28. $8\pi - 8$ (cm^2)
29. $\frac{1}{3}$ (units^2)
30. $\frac{24-3\pi}{4}$ (units^2)
31. 91 (%)
32. 81π (in^2)
33. $6\frac{2}{3}$ (units)
34. $5\sqrt{3}$ (units)
35. 11 (units)
36. 80 (degrees)
37. $r = (\sqrt{2} - 1)R$, or $r = R\sqrt{2} - R$
38. $\frac{1}{9}$
39. 11.7 (inches)
40. $6 + 4\sqrt{3}$ (in.)
41. $\sqrt{6}$
42. $27 + 2.25\pi$ (in.)
43. 10 (kilometers)
44. 6 (centimeters)
45. 29 (cm)
46. 36 (units^2)
47. $1 + \sqrt{5}$ (units)
48. 96 (degrees)
49. 15.81 (units)
50. 39 (square units)
51. $\frac{1}{3}$
52. 0 (units)
53. 13 (units)
54. $2\sqrt{13}$ (units)
55. 35.5 (units^2)
56. $4 + 2\sqrt{3}$ (units)
57. 29 (in.)
58. 60 (centimeters)
59. $(-4, 5)$
60. $(x - 3, -y - 1)$

Catalog List

1. MCC CA 44
2. MCC CA 63
3. MCC CA 74
4. MCC CA 76
5. MCC CA 85
6. MCC CA 95
7. MCC CA 137
8. MCC CA 146
9. MCC CA 156
10. MCC CA 175
11. MCC CA 201
12. MCC CA 292
13. MCC CA 314
14. MCC CA 322
15. MCC CA 335
16. MCC CA 337
17. MCC CA 344
18. MCC CB 5
19. MCC CB 10
20. MCC CB 31
21. MCC CB 32
22. MCC CB 33
23. MCC CB 35
24. MCC CB 44
25. MCC CB 46
26. MCC CB 48
27. MCC CB 53
28. MCC CB 55
29. MCC CB 58
30. MCC CB 59
31. MCC CB 61
32. MCC CB 78
33. MCC CD 7
34. MCC CD 13
35. MCC CD 19
36. MCC CD 29
37. MCC CD 39
38. MCC CD 40
39. MCC CD 63
40. MCC CE 68
41. MCC CE 82
42. MCC CE 83