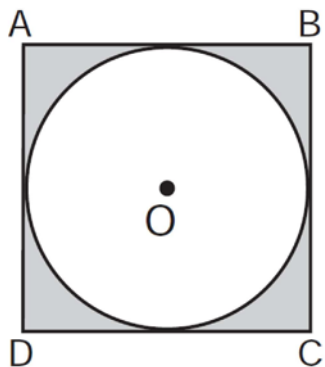


**A.G.1: Compositions of Polygons and Circles 3: Find the area and/or perimeter of figures composed of polygons and circles or sectors of a circle**

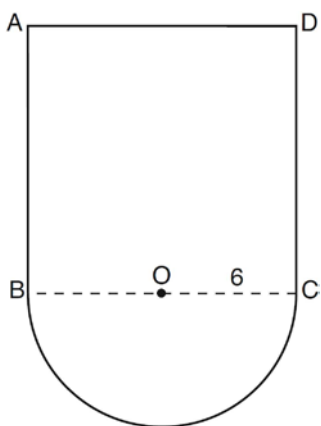
- 1 In the diagram below, circle  $O$  is inscribed in square  $ABCD$ . The square has an area of 36.



What is the area of the circle?

- 1)  $9\pi$
- 2)  $6\pi$
- 3)  $3\pi$
- 4)  $36\pi$

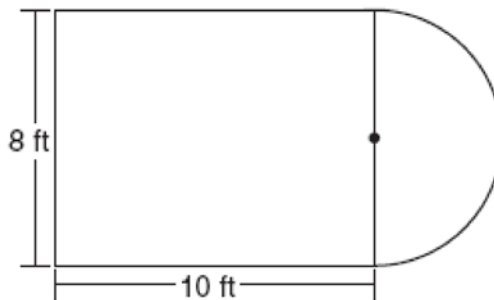
- 2 In the figure below,  $ABCD$  is a square and semicircle  $O$  has a radius of 6.



What is the area of the figure?

- 1)  $36 + 6\pi$
- 2)  $36 + 18\pi$
- 3)  $144 + 18\pi$
- 4)  $144 + 36\pi$

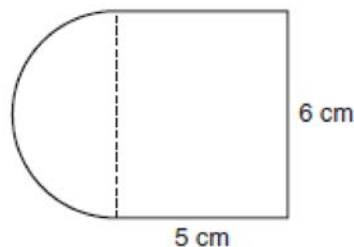
- 3 Luis is going to paint a basketball court on his driveway, as shown in the diagram below. This basketball court consists of a rectangle and a semicircle.



Which expression represents the area of this basketball court, in square feet?

- 1) 80
- 2)  $80 + 8\pi$
- 3)  $80 + 16\pi$
- 4)  $80 + 64\pi$

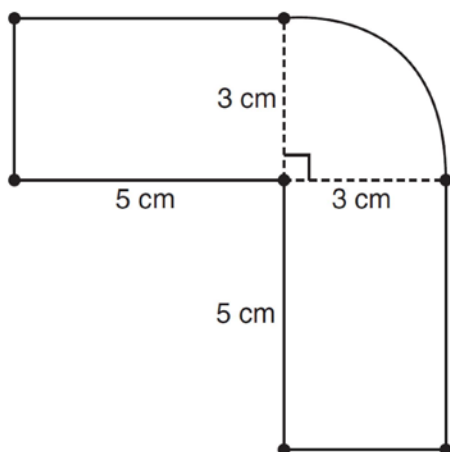
- 4 A figure is made up of a rectangle and a semicircle as shown in the diagram below.



What is the area of the figure, to the nearest tenth of a square centimeter?

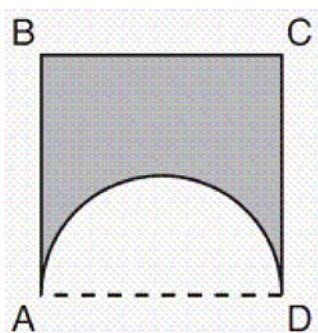
- 1) 39.4
- 2) 44.1
- 3) 48.8
- 4) 58.3

- 5 The figure shown below is composed of two rectangles and a quarter circle.



What is the area of this figure, to the *nearest square centimeter*?

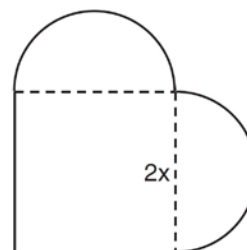
- 1) 33
  - 2) 37
  - 3) 44
  - 4) 58
- 6 A figure consists of a square and a semicircle, as shown in the diagram below.



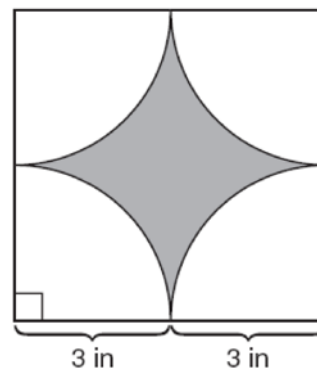
If the length of a side of the square is 6, what is the area of the shaded region?

- 1)  $36 - 3\pi$
- 2)  $36 - 4.5\pi$
- 3)  $36 - 6\pi$
- 4)  $36 - 9\pi$

- 7 A patio consisting of two semicircles and a square is shown in the diagram below. The length of each side of the square region is represented by  $2x$ . Write an expression for the area of the entire patio, in terms of  $x$  and  $\pi$ .

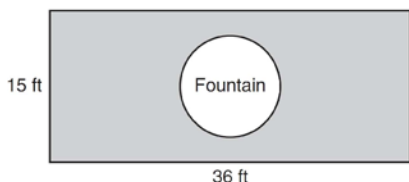


- 8 A designer created the logo shown below. The logo consists of a square and four quarter-circles of equal size.



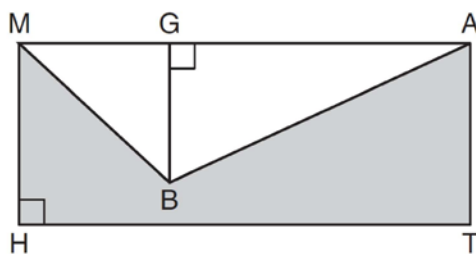
Express, in terms of  $\pi$ , the exact area, in square inches, of the shaded region.

- 9 The Rock Solid Concrete Company has been asked to pave a rectangular area surrounding a circular fountain with a diameter of 8 feet, as shown in the diagram.



Find the area, to the *nearest square foot*, that must be paved. Find the cost, *in dollars*, of paving the area if the Rock Solid Concrete Company charges \$8.95 per square foot.

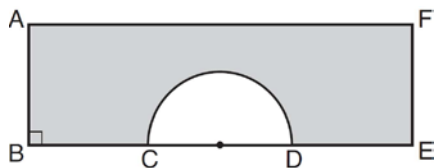
- 10 In the diagram below,  $MATH$  is a rectangle,  $GB = 4.6$ ,  $MH = 6$ , and  $HT = 15$ .



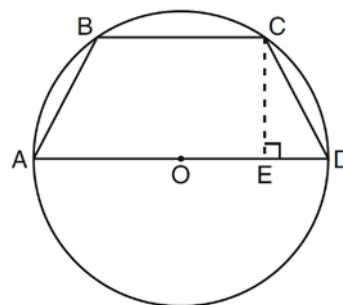
What is the area of polygon  $MBATH$ ?

- 1) 34.5
- 2) 55.5
- 3) 90.0
- 4) 124.5

- 11 In the diagram below of rectangle  $AFEB$  and a semicircle with diameter  $\overline{CD}$ ,  $AB = 5$  inches,  $AB = BC = DE = FE$ , and  $CD = 6$  inches. Find the area of the shaded region, to the *nearest hundredth of a square inch*.



- 12 In the diagram below, the circumference of circle  $O$  is  $16\pi$  inches. The length of  $\overline{BC}$  is three-quarters of the length of diameter  $\overline{AD}$  and  $CE = 4$  inches. Calculate the area, in square inches, of trapezoid  $ABCD$ .



**A.G.1: Compositions of Polygons and Circles 3: Find the area and/or perimeter of figures composed of polygons and circles or sectors of a circle**  
**Answer Section**

1 ANS: 1

If the area of the square is 36, a side is 6, the diameter of the circle is 6, and its radius is 3.  $A = \pi r^2 = 3^2 \pi = 9\pi$

REF: 011217ia

2 ANS: 3 REF: 011315ia

3 ANS: 2 REF: 080815ia

4 ANS: 2

$$A = lw + \frac{\pi r^2}{2} = 6 \cdot 5 + \frac{\pi \cdot 3^2}{2} \approx 44.1$$

REF: 061029ia

5 ANS: 2

$$A = lw + lw + \frac{\pi r^2}{4} = 5 \cdot 3 + 5 \cdot 3 + \frac{\pi \cdot 3^2}{4} \approx 37$$

REF: 011123ia

6 ANS: 2

$$6^2 - \frac{(3)^2 \pi}{2}$$

REF: 011407ia

7 ANS:

$$(2x)^2 + \pi x^2 = 4x^2 + \pi x^2$$

REF: 061431ia

8 ANS:

$$36 - 9\pi. \quad 15.6. \quad \text{Area of square} - \text{area of 4 quarter circles. } (3 + 3)^2 - 3^2 \pi = 36 - 9\pi$$

REF: 060832ia

9 ANS:

$$(15 \times 36) - \left( \pi \cdot 4^2 \right) \approx 490 \quad 490 \times 8.95 = 4385.50$$

REF: 011537ia

10 ANS: 2

shaded = whole – unshaded

= rectangle-triangle

$$= lw - \frac{1}{2}bh$$

$$= 15 \times 6 - \frac{1}{2} \times 15 \times 4.6$$

$$= 90 - 34.5$$

$$= 55.5$$

REF: 081019ia

11 ANS:

$$\text{Area of rectangle minus area of semicircle: } (5 + 6 + 5) \times 5 - \frac{\pi \times 3^2}{2} \approx 65.86$$

REF: 061339ia

12 ANS:

56. If the circumference of circle  $O$  is  $16\pi$  inches, the diameter,  $\overline{AD}$ , is 16 inches and the length of  $\overline{BC}$  is 12 inches  $\frac{3}{4} \times 16$ . The area of trapezoid  $ABCD$  is  $\frac{1}{2} \times 4(12 + 16) = 56$ .

REF: 060934ia