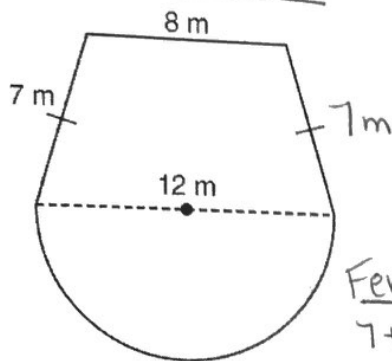


1. A garden is in the shape of an isosceles trapezoid and a semicircle, as shown in the diagram below. A fence will be put around the perimeter of the entire garden. How much fencing (in terms of  $\pi$ ) will be needed?



$$C = \frac{1}{2} \pi d$$

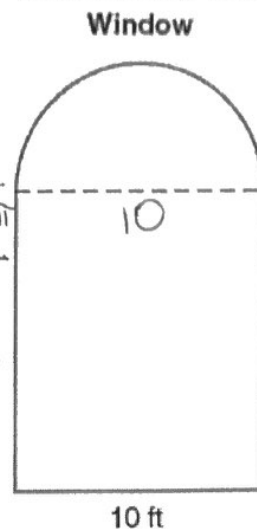
$$C = \frac{1}{2} \pi (12)$$

$$C = 6\pi$$

Fencing

$$7 + 7 + 8 + 6\pi = 22 + 6\pi$$

3. A window is made up of a single piece of glass in the shape of a semicircle and a rectangle, as shown in the diagram below. Tess is decorating for a party and wants to put a string of lights all the way around the outside edge of the window. To the nearest foot, what is the length of the string of lights that Tess will need to decorate the window?



$$C = \frac{1}{2} \pi d$$

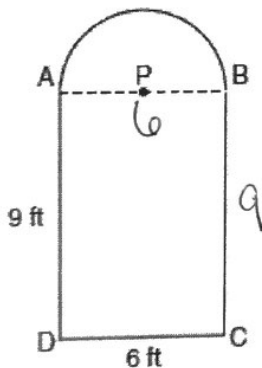
$$C = \frac{1}{2} \pi (10)$$

$$C = 5\pi \approx 16$$

Lights

$$12 + 10 + 12 + 16 = 50 \text{ ft}$$

2. Serena's garden is a rectangle joined with a semicircle, as shown in the diagram below. Line segment  $AB$  is the diameter of semicircle  $P$ . Serena wants to put a fence around her garden. Calculate the length of fence Serena needs to the nearest tenth of a foot.



$$C = \frac{1}{2} \pi d$$

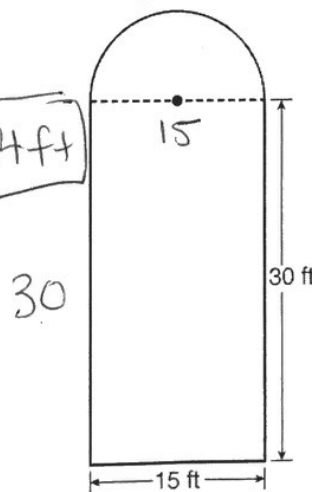
$$C = \frac{1}{2} \pi (6)$$

$$C = 3\pi \approx 9.4$$

Fencing

$$9 + 6 + 9 + 9.4 = 33.4 \text{ ft}$$

4. Ross is installing edging around his pool, which consists of a rectangle and a semicircle, as shown in the diagram below. Determine the length of edging, to the nearest tenth of a foot, that Ross will need to go completely around the pool.



$$C = \frac{1}{2} \pi d$$

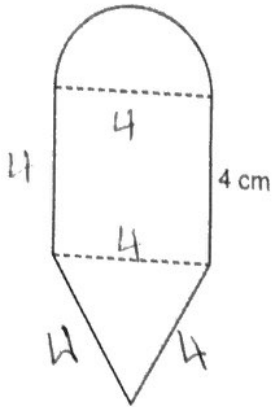
$$C = \frac{1}{2} \pi (15)$$

$$C = 7.5\pi \approx 23.6$$

Edging

$$30 + 15 + 30 + 23.6 = 98.6 \text{ ft}$$

5. The diagram below consists of a square with a side of 4 cm, a semicircle on the top, and an equilateral triangle on the bottom. Find the perimeter of the figure to the nearest tenth of a centimeter.



$$C = \frac{1}{2} \pi d$$

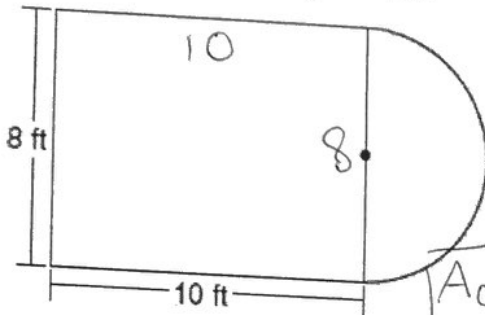
$$C = \frac{1}{2} \pi (4)$$

$$C = 2\pi \approx 6.3$$

$$P = 6.3 + 4 + 4 + 4 + 4$$

$$P = 22.3 \text{ cm}$$

6. 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?



$$A = \frac{1}{2} \pi r^2$$

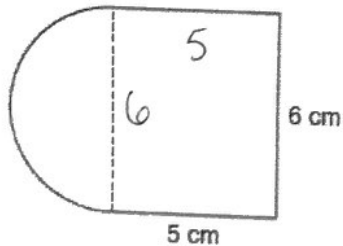
$$A = \frac{1}{2} \pi (4)^2$$

$$A = 8\pi$$

$$A_{\text{court}} = 8\pi + 80 \text{ ft}^2$$

$$\approx 105 \text{ ft}^2$$

7. 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?



$$A = \frac{1}{2} \pi r^2$$

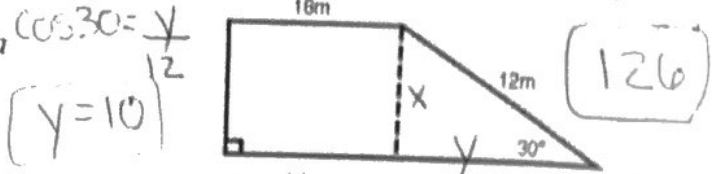
$$A = \frac{1}{2} \pi (3)^2$$

$$A = 4.5\pi$$

$$A_{\text{figure}} = 4.5\pi + 30$$

$$\approx 44.1 \text{ cm}^2$$

8. What is the area of the trapezoid below to the nearest square foot? (hint: Use TRIG)



$$\cos 30 = \frac{y}{12}$$

$$(y = 10)$$

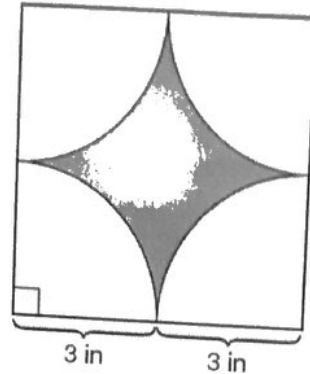
$$\sin 30 = \frac{x}{12}$$

$$x = 6$$

$$A_{\text{rect}} = 16(6) = 96$$

$$A_{\text{tri}} = \frac{1}{2}(6)(10) = 30$$

9. 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.



$$A_{\text{circle}} = \pi (3)^2$$

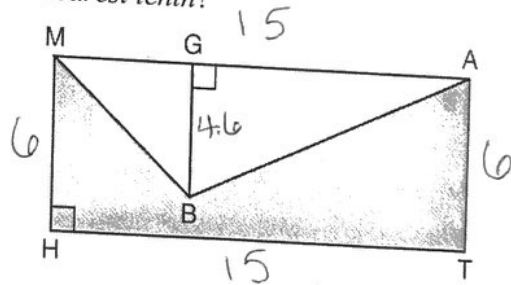
$$= 9\pi$$

$$A_{\text{square}} = (6)(6)$$

$$= 36$$

$$A = 36 - 9\pi$$

10. In the diagram below, MATH is a rectangle,  $GB = 4.6$ ,  $MH = 6$ , and  $HT = 15$ . What is the area of polygon MBATH to the nearest tenth?



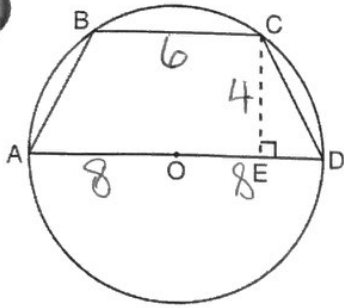
$$A_{\text{rectangle}} = (15)(6) = 90$$

$$A_{\text{triangle}} = \frac{1}{2}(15)(4.6)$$

$$= 34.5$$

$$A = 90 - 34.5 = 55.5$$

11. 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  $ABCD$ .



$$C = \pi d$$

$$16\pi = \pi d$$

$$16 = d$$

$$8 = r$$

$$A_{\text{trap}} = \frac{1}{2}(b_1 + b_2)h$$

$$= \frac{1}{2}(16 + 6)(4)$$

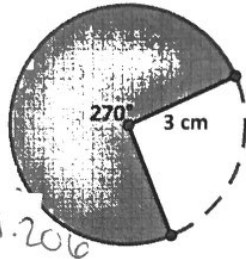
$$= 44 \text{ in}^2$$

12. Determine the area and circumference of the circle sectors below.

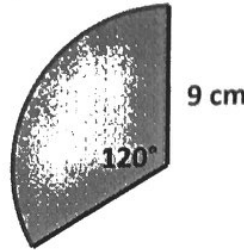
a)

b)

①  $A_{\text{circle}} = \pi(3)^2$   
 $= 9\pi$



$$\frac{270}{360} \cdot 9\pi = \frac{3}{4} \cdot 9\pi = 21.206$$



①  $A = \pi(9)^2$   
 $= 81\pi$

$$\frac{120}{360} \cdot 81\pi = \frac{1}{3} \cdot 81\pi = 27\pi$$

②  $C = \pi(6)$   
 $= 6\pi$

① Area = 21.2

① Area = 27π

②  $C = \pi(18) = 18\pi$

② Circumference = 14.14, ② Circumference = 6π

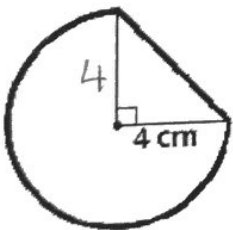
$$\frac{120}{360} \cdot 18\pi = \frac{1}{3} \cdot 18\pi = 6\pi$$

$$\frac{270}{360} \cdot 6\pi = \frac{3}{4} \cdot 6\pi = 14.137$$

(hundredth)

(in terms of  $\pi$ )

13. Find the area of the figure below.



$$\text{Area} = 37.7 + 8 = 45.7 \text{ cm}^2 \text{ (tenth)}$$

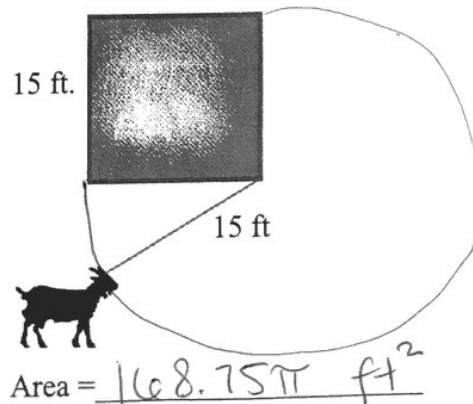
$$A_{\text{circle}} = \frac{3}{4}\pi r^2$$

$$= \frac{3}{4}\pi(4)^2$$

$$= 12\pi \approx 37.7$$

$$A_{\text{triangle}} = \frac{1}{2}bh = \frac{1}{2}(4)(4) = 8$$

14) A goat is tied to the edge of a square barn with a 15 foot lead. This is a top down view of the barn and the goat. The goat cannot go through the barn. What is the total grazing area for the goat in terms of  $\pi$ ?



$$A = \frac{3}{4}\pi r^2$$

$$A = \frac{3}{4}\pi(15)^2$$

$$A = 168.75\pi$$

$$\text{Area} = 168.75\pi \text{ ft}^2$$