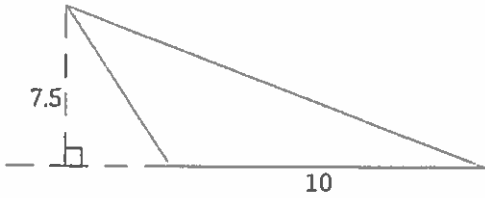


Name: Key

Date: \_\_\_\_\_ Per: \_\_\_\_\_

Rescan

Find the area of each shape based on the provided measurements. Explain how you found each area.

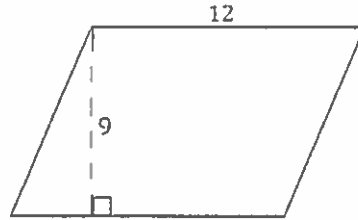


$$A_{\Delta} = \frac{1}{2}bh$$

$$A = \frac{1}{2}(10)(7.5)$$

$$A = 5(7.5)$$

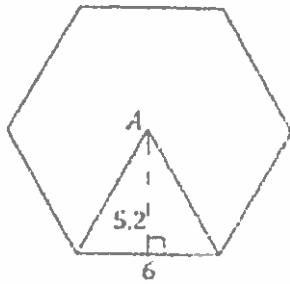
$$A = 37.5 \text{ sq. units}$$



$$A_{\square} = bh$$

$$A = 12(9)$$

$$A = 108 \text{ sq. units}$$



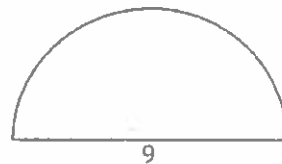
$$A = 6 \left[ \frac{1}{2}bh \right]$$

$$A = 6 \left[ \frac{1}{2}(6)(5.2) \right]$$

$$A = 6 [3(5.2)]$$

$$A = 6(15.6)$$

$$A = 93.6 \text{ sq. units}$$



$$A_{\theta} = \frac{1}{2}(\pi r^2)$$

$$A = \frac{1}{2}(3.14(4.5)(4.5))$$

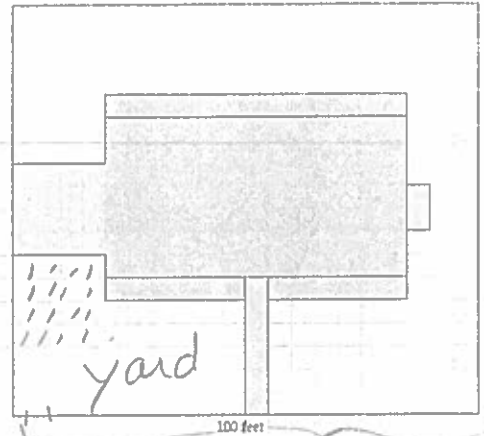
$$A = \frac{1}{2}[63.585]$$

$$A = 31.7925 \text{ sq. units}$$

# Many Approaches

## Problem 1

A landscape company wants to plant lawn seed. A 20 lb. bag of lawn seed will cover up to 420 sq. ft. of grass and costs \$49.98 ~~plus the 8% city tax~~. A scale drawing of a rectangular yard is given. The length of the longest side is 100 ft. The house, driveway, sidewalk, garden areas, and utility pad are shaded. The unshaded area has been prepared for planting grass. How many 20 lb. bags of lawn seed should be ordered, and what is the cost?



20 lb bag  $\rightarrow$  covers 420 sq. ft.  
 20 lb bag  $\rightarrow$  costs \$49.98

220 squares  
 not shaded

Area (not shaded region)

$$A = (\# \text{ squares}) (\text{Area of Each Square})$$

$$A = 220(25)$$

$$A = 5,500 \text{ sq. ft.}$$

$$100 \div 20 \text{ squares}$$

5 ft each — side.

$$\begin{array}{c} \square \\ 5 \end{array} \rightarrow 25 \text{ sq. ft. Area}$$

The company needs to cover 5,500 sq. ft. with grass seed.

$$\frac{(\text{Total Area})}{(\text{Coverage Per bag})}$$

$$5,500 \div 420$$

$$13.0952$$

14 bags needed

$$\begin{array}{r} 13 \rightarrow \text{need} \\ 420 \overline{) 5500} \\ \underline{- 420} \phantom{0} \\ 1300 \\ \underline{- 1260} \\ 40 \end{array} \quad \begin{array}{l} 14 \text{ bag} \\ \end{array}$$

$$\left( \begin{array}{c} \text{Cost} \\ \text{bag} \end{array} \right) \left( \begin{array}{c} \# \text{ of} \\ \text{bags needed} \end{array} \right)$$

$$\$49.98 (14)$$

$$\$699.72 \text{ total cost.}$$

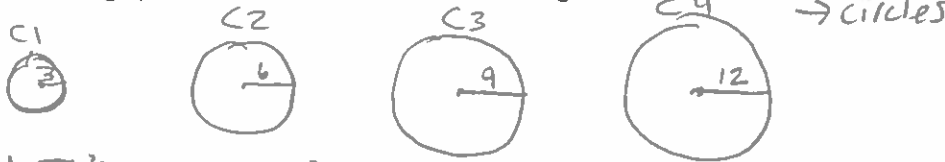
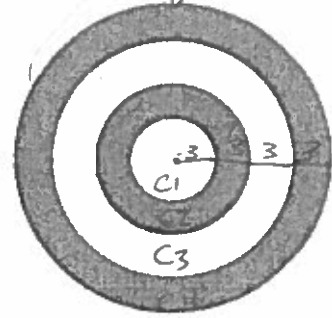
The landscape company needs to purchase 14 bags of grass seed to cover the lawn. This will cost them, \$699.72.

Problem 2

$$\begin{aligned} 1 \text{ ft} &= 12 \text{ in} \\ 1 \text{ sq ft} &= 144 \text{ sq in.} \end{aligned}$$

Ten dartboard targets are being painted as shown in the following figure. The radius of the smallest circle is 3 in. and each successive, larger circle is 3 in. more in radius than the circle before it. A "tester" can of red and of white paint is purchased to paint the target. Each 8 oz. can of paint covers 16 sq. ft. Is there enough paint of each color to create all ten targets?

Conversion  
 16 sq ft → 1 can  
 1 sq ft → 144 sq in.



$$\begin{aligned} A &= \pi r^2 \\ A &= 3.14(3)(3) & A &= 3.14(6)(6) & A &= 3.14(9)(9) & A &= 3.14(12)(12) \\ A &= 28.26 & A &= 113.04 & A &= 254.34 & A &= 452.16 \end{aligned}$$

white paint

$$\begin{aligned} &C1 + [C3 - C2] \\ &28.26 + [254.34 - 113.04] \\ &28.26 + 141.30 \\ &169.56 \text{ sq. in} \end{aligned}$$

$$\begin{aligned} &\times \frac{10 \text{ Targets}}{144 \text{ sq. in (1 sq ft)}} \\ &\underline{16956 \text{ sq. in}} \\ &144 \text{ sq. in (1 sq ft)} \\ &\approx \underline{117.785 \text{ sq. ft. (white)}} \text{ * good needed } < 16 \text{ sq. ft.} \end{aligned}$$

Red Paint

$$\begin{aligned} &[C4 - C3] + [C2 - C1] \\ &(452.16 - 254.34) + (113.04 - 28.26) \\ &197.82 + 84.78 \end{aligned}$$

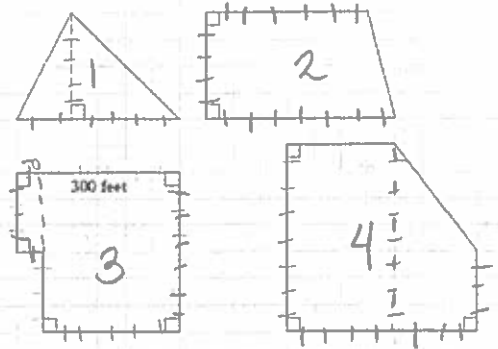
$$\begin{aligned} &282.6 \text{ sq. in.} \\ &\times \frac{10 \text{ targets}}{144 \text{ sq. in (1 sq ft)}} \\ &\underline{2826 \text{ sq. in.}} \\ &144 \text{ sq. in (1 sq ft)} \\ &\approx \underline{19.63 \text{ sq. ft.}} \end{aligned}$$

\* not good (red) needed > 16 sq. ft. needed

There is not enough red paint to paint all 10 targets, but there is enough white paint.

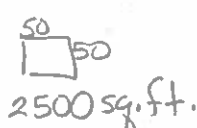
Problem Set

3. A farmer has four pieces of unfenced land as shown below in the scale drawing where the dimensions of one side are given. The farmer trades all of the land and \$10,000 for 8 acres of similar land that is fenced. If one acre is equal to 43,560 ft<sup>2</sup>, how much per square foot for the extra land did the farmer pay rounded to the nearest cent?



$$\text{Area 1} + \text{Area 2} + \text{Area 3} + \text{Area 4}$$

$$\begin{aligned} & \frac{1}{2}bh + \frac{1}{2}h(b_1+b_2) + bh + bh \\ & \frac{1}{2}(6)(4) + \frac{1}{2}(4)(7+6) + 5(6) + 1(3) \\ & 12 + 26 + 33 + 33 + 2500 \text{ sq. ft.} \end{aligned}$$



$$\begin{aligned} & bh + \frac{1}{2}h(b_1+b_2) \\ & 4(7) + \frac{1}{2}(3(7+3)) \\ & 28 + 15 \\ & 43 \end{aligned}$$

$$\begin{aligned} TA &= 12 + 26 + 33 + 43 \\ TA &= 114 \text{ sq. units.} \\ & \times 2500 \text{ sq. ft.} \quad \text{] convert} \\ TA &= 285,000 \text{ sq. ft.} \end{aligned}$$

$$\begin{aligned} \text{Acre} &= 43,560 \text{ sq. ft.} \\ \text{sq. ft} & \div \text{Acre} \\ 285,000 & \div 43,560 \\ & 6.54 \text{ (about) acres} \\ 8 \text{ acres} & - 6.54 \text{ acres} \\ & 1.46 \text{ acres extra} \end{aligned}$$

$$\begin{aligned} & \text{extra acres} \times \text{sq. ft. in Acre} \\ & 1.46 \times 43,560 \\ & \approx 63,597.6 \text{ sq. ft.} \\ & \frac{\$10,000}{63,597.6} \\ & \approx \$0.16 \end{aligned}$$

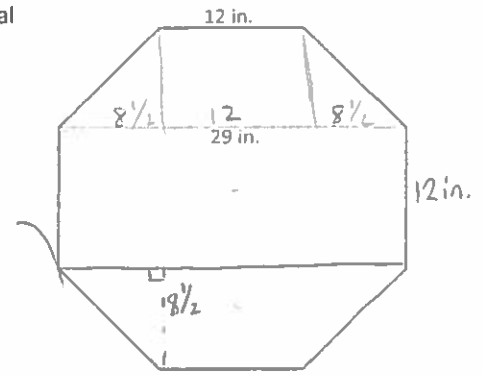
4. An ordinance was passed that required farmers to put a fence around their property. The least expensive fences cost \$10 for each foot. Did the farmer save money by moving the farm?

$$\begin{aligned} & \$10 \text{ each foot} \\ & \$10,000 \text{ would buy } 1,000 \text{ ft of fencing.} \\ A_3 & \rightarrow P = 300 + 250 + 300 + 150 + 200 \\ A_3 & \rightarrow P = 1200 \text{ ft.} \end{aligned}$$

It would cost over 10,000 to fence just one area of land, so the farmer got did save money.

The farmer paid \$0.16 per sq. foot.

5. A stop sign is an octagon (i.e., a polygon with eight sides) with eight equal sides and eight equal angles. The dimensions of the octagon are given. One side of the stop sign is to be painted red. If Timmy has enough paint to paint 500 sq. ft. (72,000 sq. in.) can he paint 100 stop signs? Explain your answer.



Stop sign

Area Rectangle + 2 Trapezoids

(Total Area)

$$TA = bh + 2 \left[ \frac{1}{2}h(b_1 + b_2) \right]$$

$$TA = 29(12) + 2 \left[ \frac{1}{2}(8\frac{1}{2})(29 + 12) \right]$$

$$29 TA = 348 + 2 \left[ \frac{1}{2}(8\frac{1}{2})(41) \right]$$

$$\frac{58}{348} TA = 348 + 2 [174.25]$$

$$TA = 348 + 348.50$$

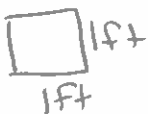
$$TA = 696.5 \text{ sq. in.} \rightarrow 1 \text{ stop sign}$$

(Area 1 sign) (# of signs)

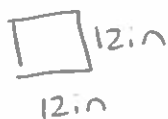
$$696.5 (100)$$

$$* 69,650 \text{ sq. in.}$$

Timmy has enough paint to cover 69,650 sq. in. because he has enough paint to cover 72,000 sq. in.



$$A = 1 \text{ sq. ft.}$$



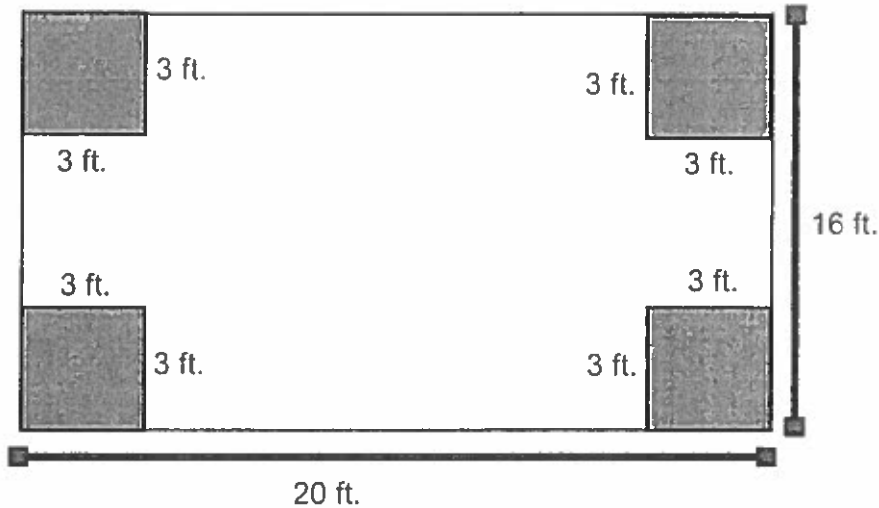
$$A = 144 \text{ sq. in.}$$

conversion

$$696.5 \text{ sq. inches} \rightarrow \approx 4.84 \text{ sq. ft.}$$

$$\div 144 \text{ sq. inches}$$

6. Mr. Fitzhugh is planning a concrete patio for his back yard. He wants to include flower beds in each corner. Below is a diagram of what he wants to make.



- A. How many square feet does he need to cover with concrete?

$$\begin{array}{r}
 \text{Area } \square - \text{Area flowers} \\
 bh - 4 [ bh ] \\
 20(16) - 4 [ 3(3) ] \\
 320 - 4 [ 9 ] \\
 320 - 36 \\
 284 \text{ sq. ft. of concrete}
 \end{array}$$

Mr. Fitzhugh will need to cover 284 sq. ft. with concrete.

- B. If he puts a wire fence around each flower bed, how many feet of fence does he need?

perimeter

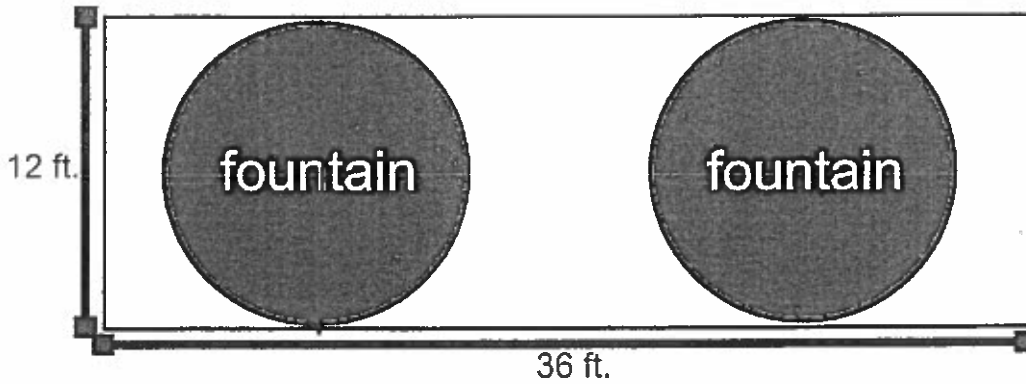
Perimeter of 4 flower beds

$$4 \left[ \begin{array}{l} P = 3(4) \\ P = 12 \end{array} \right]$$

$$\text{T.P.} = 48 \text{ feet.}$$

Mr. Fitzhugh will need to buy 48 feet of fencing.

7. P.S. is planning to build a fountain over part of their court yard. A diagram of what the landscaping is to look like is below.



- A. How many feet of fencing is needed to enclose the fountains?

Circumference  
of Circles

$$2 \left[ \begin{array}{l} C = \pi d \\ C \approx 3.14(12) \\ C \approx 37.68 \end{array} \right]$$

T.C.  $\rightarrow$  75.36 feet

75.36 feet of fencing  
will be needed  
to enclose the  
fountains.

- B. How much area do the two fountains take up?

Area Circles

$$2 \left[ \begin{array}{l} A = \pi r^2 \\ A \approx 3.14(6)(6) \\ A \approx 3.14(36) \\ A \approx 113.04 \end{array} \right]$$

T.A. = 226.08 sq. ft.

The fountains will  
take up 226.08 sqf  
of space.

- C. How many square feet of sod are needed to cover the indicated space?

Area  $\square$

- Area Os

bh

- (226.08)

36(12)

- 226.08

432

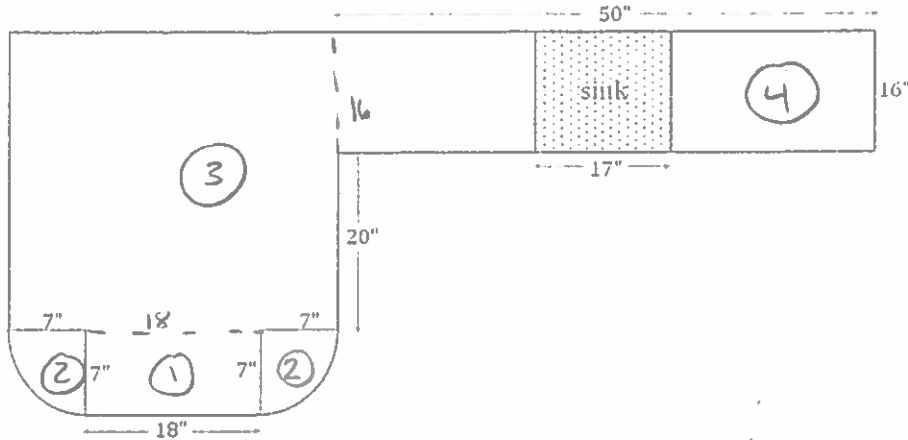
- 226.08

The sod will  
need to cover  
205.92 square  
feet of area.

T.A. = 205.92 sq. ft

8. The Smith family is renovating a few aspects of their home. The following diagram is of a new kitchen countertop. Approximately how many square feet of counter space is there?

Area



Imp. Info drawing

Area 1 + Area 2 + Area 3 + Area 4 [Rectangle - sink]

$$A = bh$$

$$A = 7(18)$$

$$A = 126$$

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

$$A = (3.14(7)(7)) \frac{1}{2}$$

$$A = 76.93$$

$$A = bh$$

$$A = 36(32)$$

$$A = 1152$$

$$A = bh$$

$$A = 16(50) - 17(16)$$

$$A = 800 - 272$$

$$A = 528$$

$$TA = 126 + 76.93 + 1152 + 528$$

$$TA = 1882.93 \text{ sq inches.} \rightarrow \frac{1882.93 \text{ sq.in.}}{144 \text{ sq.in.}}$$

$$\begin{array}{|c|} \hline 1\text{ft} \\ \hline 1\text{ft} \\ \hline 1\text{sq. ft} \\ \hline \end{array}$$

$$\begin{array}{|c|} \hline 12\text{in} \\ \hline 12\text{in} \\ \hline 144\text{sq.in.} \\ \hline \end{array}$$

$$\approx 13.08 \text{ sq. ft}$$

conversion

The Smith family will have about 13.1 sq. ft. of counter space.

or 1882.93 sq.in.