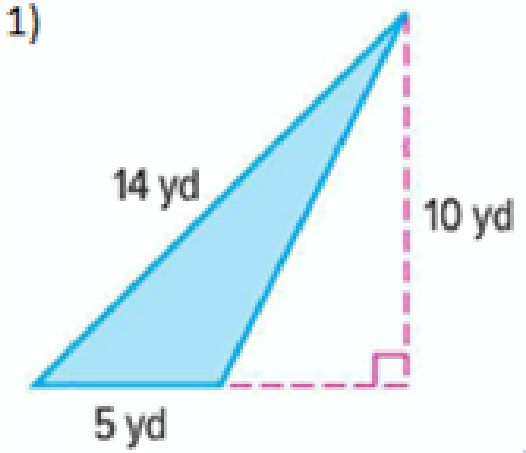
Grab a Warm Up worksheet and get to work. Formulas are on p. 632 if you need them.

Classwork - Finding the Area of Composite Figures

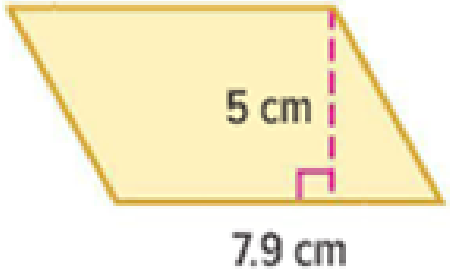
Find the area of the following 2D figures. SHOW WORK AND LABEL

1)



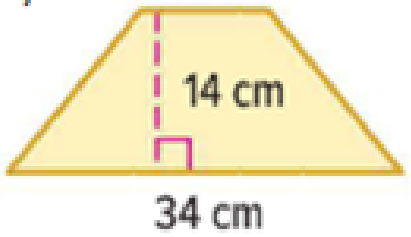
$A = \frac{1}{2}(5)(10) = 25 yd^2$

2)



$A = 5(7.9) = 39.5 cm^2$

3)

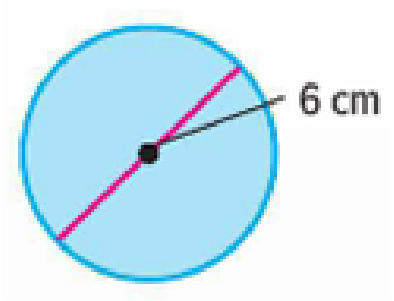


$A = \frac{1}{2}(11+34) \cdot 14$

$A = \frac{1}{2}(45) \cdot 14$

$A = 315 cm^2$

4)

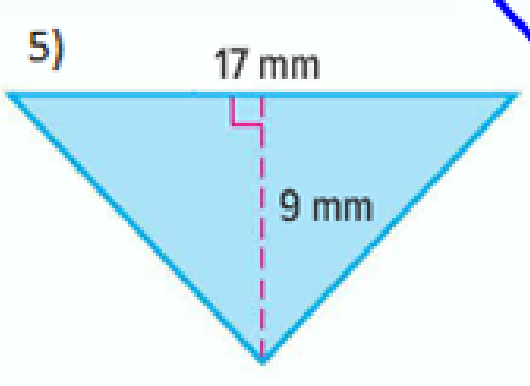


$r = 3\text{ cm}$

$A = 3.14(3^2)$

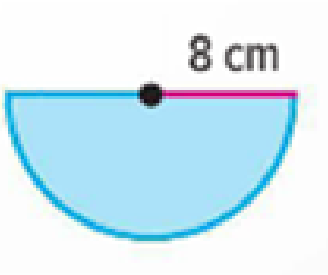
$A = 28.3\text{ cm}^2$

5)



$A = \frac{1}{2}(17)(9) = 76.5\text{ mm}^2$

6)



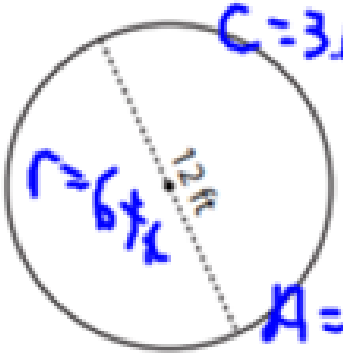
$A = 3.14(8^2)$

$= 201\text{ cm}^2$

$\frac{201}{2} = 100.5\text{ cm}^2$

1) Find the circumference and area of the following circles. Use the 3.14 for π. SHOW WORK and LABEL. Round to the nearest tenth → One number past the decimal point.

A)



C = 37.7 ft

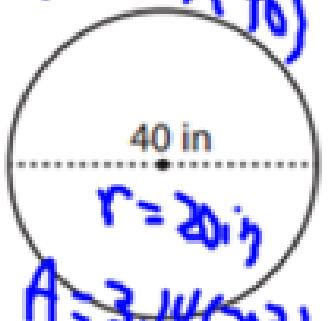
A = 113 ft²

B)

C = 113 cm

A = 1017.9 cm²

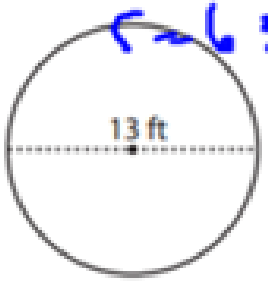
C)



C = 125.6 in

A = 1256 in²

D)



C = 40.8 ft

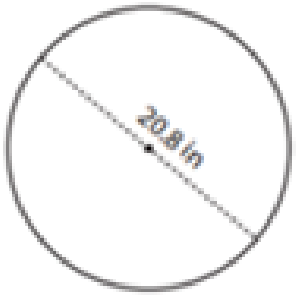
A = 132.7 ft²

E)

C = 18.8 in

A = 28.3 in²

F)

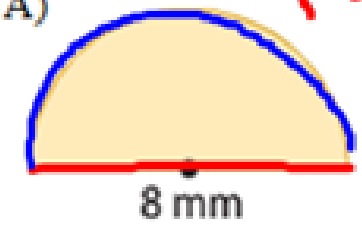


C = 65.3 in

A = 339.6 in²

2) Find the distance around and area of the following figures. Use the 3.14 for π. SHOW WORK and LABEL. Round to the nearest tenth → One number past the decimal point.

A)



r = 4mm

$C = 3.14(8) = 25.1mm$

$\frac{25.1}{2} = 12.6mm$

$12.6 + 8 = 20.6mm$

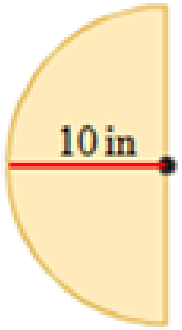
Distance around = 20.6mm

Area = $25.1mm^2$

$A \text{ of whole } O = 3.14(4^2) = 50.2mm^2$

$A = \frac{50.2}{2} = 25.1mm^2$

B)



$C = 3.14(20) = 62.8in$

$\frac{62.8}{2} = 31.4$

$31.4 + 20 = 51.4in$

Distance around = 51.4 in

Area = $157in^2$

$A = 3.14(10^2) = 314in^2$

$A = \frac{314}{2} = 157in^2$

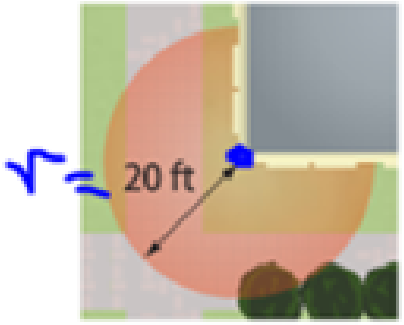
3) A motion detector at the corner of a building can detect motion outside within a radius of 20 feet as shown. Within what area can it detect motion? Round to the nearest tenth.

$A = 3.14(20^2)$

$= 1256 ft^2$

$1256 \cdot \frac{3}{4}$

$A = 942 ft^2$



*4) What is the area of the CD shown to the right? Round to the nearest tenth.

Hint→ ***The open space inside the CD isn't part of the area of the CD***

Big O

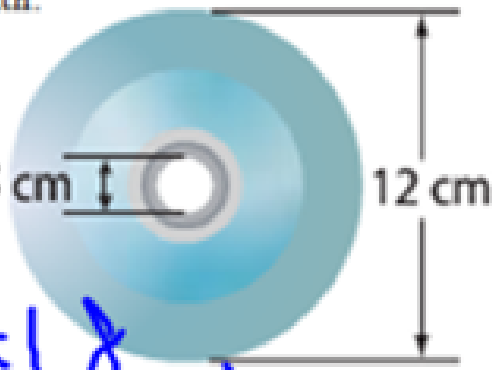
$r = 6 cm$

$A = 3.14(6^2) = 113.04 cm^2$

Little O

$r = 0.75 cm$

$A = 3.14(0.75^2) = 1.8 cm^2$



$A = 113 - 1.8 = 111.2 cm^2$

5) Lauren has a sprinkler positioned in her lawn that directs a 12 foot spray in a circular pattern. About how much of the actual grass lawn does the sprinkler water if there is a rectangular flower bed 3 feet by 6 feet that is also in the path of the spray? Round to the nearest tenth.

A of $\bigcirc = 3.14(12^2) = 452.16 ft^2$

A of $\square = 3 \cdot 6 = 18 ft^2$

A of grass $= 452.16 - 18 = 434.16 ft^2$

6) The trunk of the General Sherman Tree in Sequoia National Park has a circumference of 102.6 feet. If the tree were cut down at the base, what would be the area of the cross section? Round to the nearest tenth.
Hint → ***Use the circumference to find the diameter/radius and then you can find the area.***

$C = 102.6 ft$

$C = 3.14d$

$\frac{102.6}{3.14} = \frac{3.14d}{3.14}$

$d = 32.7 ft$

$\div 2$

$r = 16.35 ft$

$A = 3.14(16.35^2)$

$A = 839.4 ft^2$

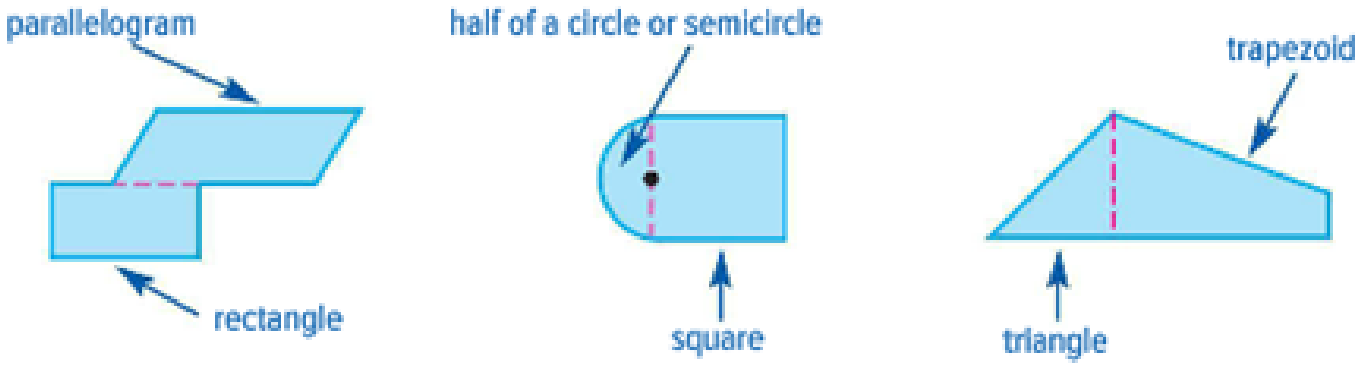
Find the Area of a Composite Figure

p. 632

A **composite figure** is made up of two or more shapes.

To find the area of a composite figure, decompose the figure into shapes with areas you know. Then find the sum of these areas.

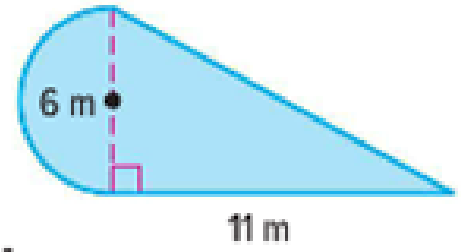
Shape	Words	Formula
Parallelogram	The area A of a parallelogram is the product of any base b and its height h.	$A = bh$
Triangle	The area A of a triangle is half the product of any base b and its height h.	$A = \frac{1}{2}bh$
Trapezoid	The area A of a trapezoid is half the product of the height h and the sum of the bases, b_1 and b_2.	$A = \frac{1}{2}h(b_1 + b_2)$
Circle	The area A of a circle is equal to π times the square of the radius r.	$A = \pi r^2$



Example

Tutor

1. **Find the area of the composite figure.**



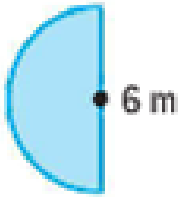
The figure can be separated into a semicircle and a triangle.

Area of semicircle

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

$$A \approx \frac{1}{2} \cdot 3.14 \cdot 3^2$$

$$A \approx 14.1$$



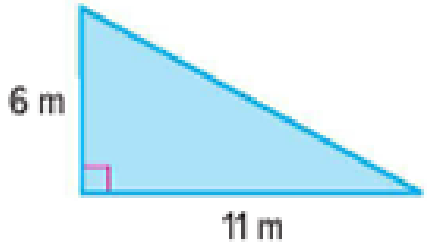
r = 3m

Area of triangle

$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2} \cdot 11 \cdot 6$$

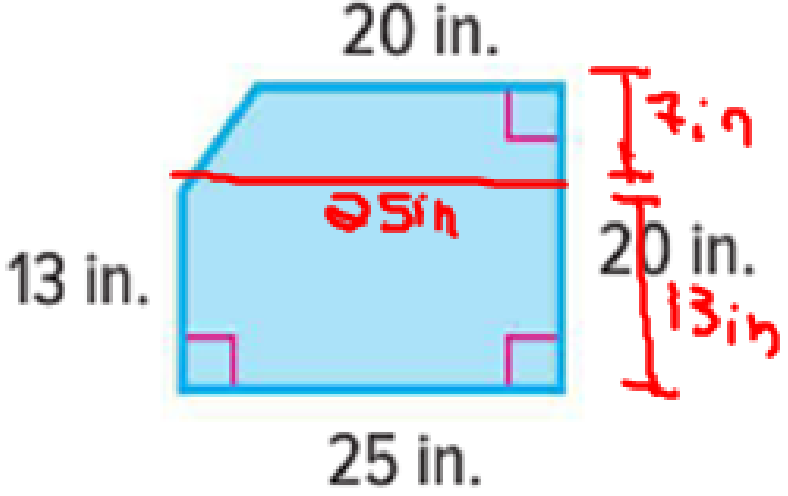
$$A = 33$$



The area of the figure is about 14.1 + 33 or 47.1 square meters.

Got it? **Do this problem to find out.**

a. Find the area of the figure. Round to the nearest tenth if necessary.



A of Trap $= \frac{1}{2}(20+25) \cdot 7$
$= 157.5 \text{ in}^2$

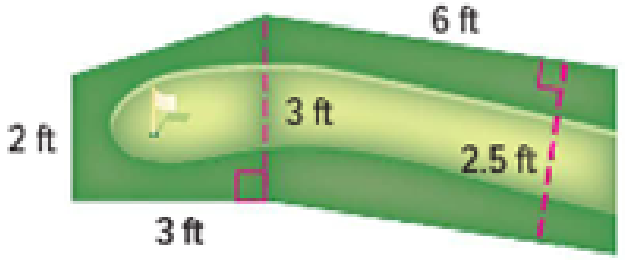
A of $\square = 25 \cdot 13 = 325 \text{ in}^2$

Total A $= 157.5 + 325 = 482.5 \text{ in}^2$

Example

Watch Tutor

2. A miniature golf hole is composed of a trapezoid and a parallelogram. How many square feet of turf does the hole cover?

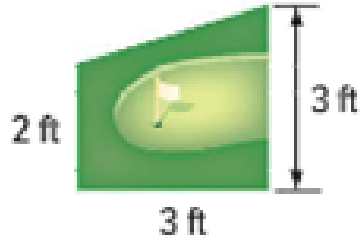


Area of trapezoid

$A = \frac{1}{2}h(b_1 + b_2)$

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

$A = 7.5$

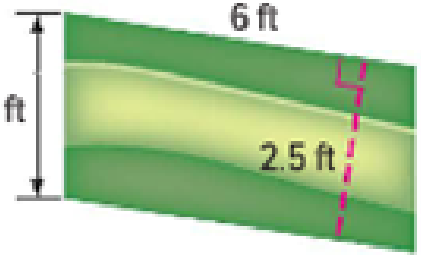


Area of parallelogram

$A = bh$

$A = 6 \cdot 2.5$

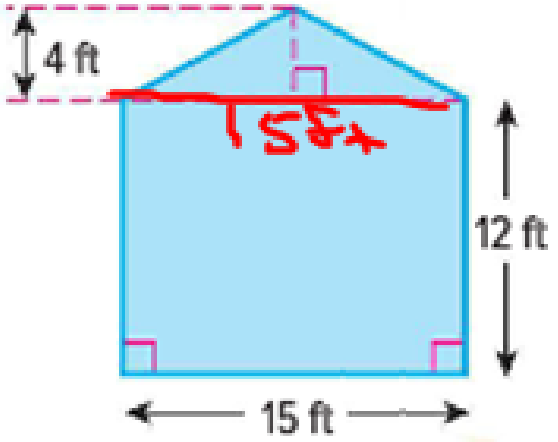
$A = 15$



So, 7.5 + 15 or 22.5 square feet of turf will be needed.

Got it? **Do this problem to find out.**

b. Pedro's father is building a shed. How many square feet of wood are needed to build the back of the shed shown at the right?



A of $\square = 15 \cdot 12 = 180 ft^2$

A of $\triangle = \frac{1}{2}(15)(4) = 30 ft^2$

$A = 30 + 120 = 210 ft^2$

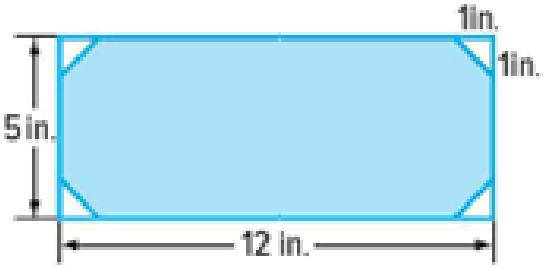
Find the Area of a Shaded Region

Use the areas you know to find the area of a shaded region.

Examples

Tutor

3. **Find the area of the shaded region.**



Find the area of the rectangle and subtract the area of the four congruent triangles.

Area of rectangle

$A = \ell w$

$A = 12 \cdot 5$ $\ell = 12, w = 5$

$A = 60$ Simplify.

Area of triangles

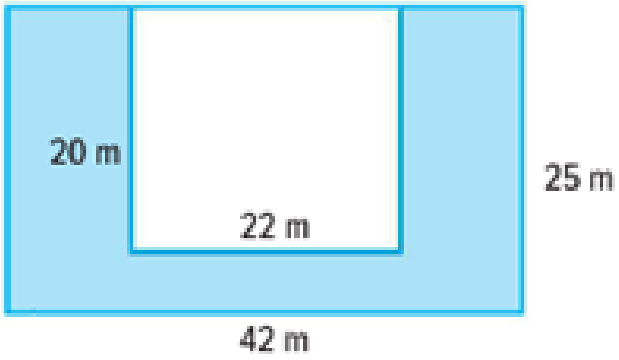
$A = 4 \cdot \left(\frac{1}{2}bh\right)$

$A = 4 \cdot \frac{1}{2} \cdot 1 \cdot 1$ $b = 1, h = 1$

$A = 2$ Simplify.

The area of the shaded region is $60 - 2$ or 58 square inches.

4. **The blueprint for a hotel swimming area is represented by the figure shown. The shaded area represents the pool. Find the area of the pool.**



Find the area of the entire rectangle and subtract the section that is not shaded.

Area of the entire rectangle

$A = \ell w$

$A = 42 \cdot 25$ or 1,050

Area not shaded

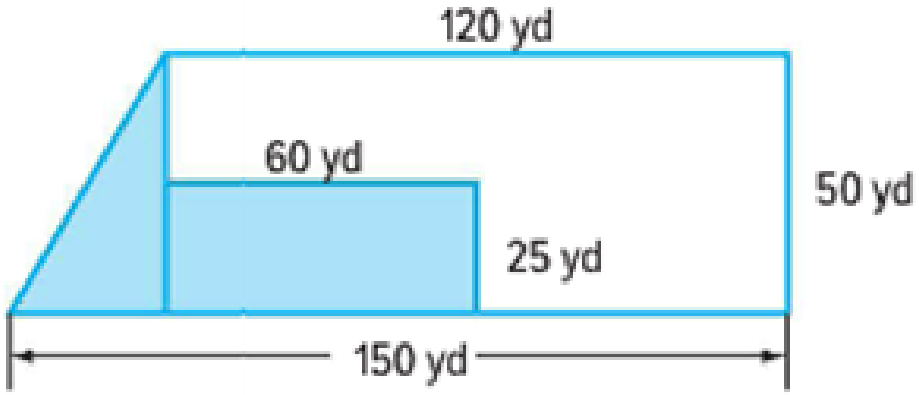
$A = \ell w$

$A = 22 \cdot 20$ or 440

The area of the shaded region is 1,050 − 440 or 610 square meters.

Got it? **Do this problem to find out.**

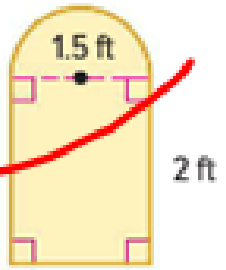
c. A diagram for a park is shown. The shaded area represents the picnic sections. Find the area of the picnic sections.



Guided Practice

1. Mike installed the window shown. How many square feet is the window? Round to the nearest tenth. Use 3.14 for π.

(Examples 1 and 2)



A of □ = 11 • 6 = 66 ft²

A of Δ = $\frac{1}{2}$(6)(4) = 12 ft²

A = 66 − 12 = 54 ft²

2. A triangle is cut from a rectangle. Find the area of the shaded region.

(Examples 3 and 4)