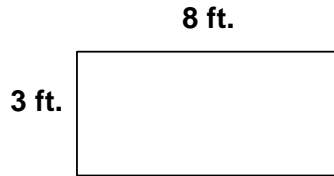


Area

While perimeter can be measured, a calculation is required to find the area of a figure. To find the area of a rectangle the length and width are multiplied.



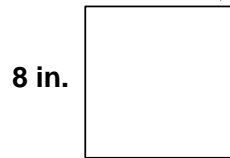
The area of the above rectangle is:

$$A = lw$$

$$A = (3\text{ft.})(8\text{ft.})$$

$$A = 24 \text{ square feet.}$$

Notice that since the dimensions of the rectangle were given in feet the area has a dimension of square feet or ft.^2 because we multiplied the dimensions, $(\text{ft.})(\text{ft.})$.



The area of the above square is:

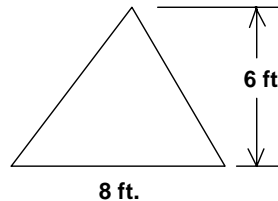
$$A = lw$$

$$A = (8\text{in.})(8\text{in.}), \text{ since the length and width of a square are the same.}$$

$$A = 64 \text{ in.}^2$$

The area of a triangle is calculated by multiplying the base by the height and dividing by 2, or stated as $1/2$ the product of the base and height. The height is defined as the perpendicular distance from the base to the apex or top of the triangle.

$$A = \frac{bh}{2} \quad \text{or} \quad A = \frac{1}{2}bh$$



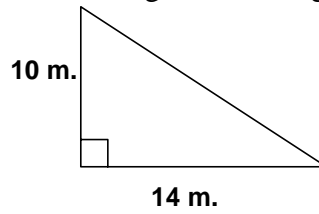
The area of the above triangle is:

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

$$A = \frac{(8\text{ft.})(6\text{ft.})}{2}$$

$$A = 24 \text{ ft.}^2$$

If the triangle is a right triangle, the base and height are the legs of the right triangle.



The area of the above triangle is:

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

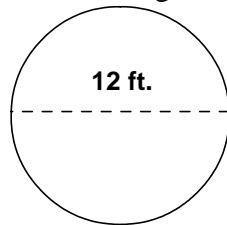
$$A = \frac{(14\text{m.})(10\text{m.})}{2}$$

$$A = 70\text{m.}^2$$

The area of a circle is calculated by the following formula:

$A = \pi r^2$, where r is the radius of the circle and π (pi) is approximately 3.14.

A circle with diameter given



$$A = \pi r^2$$

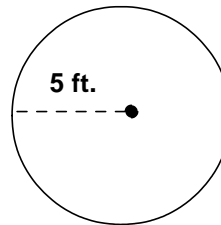
$$A = \pi(6\text{ft.})^2$$

$$A = 36\pi \text{ ft}^2$$

or

$$A = 113.04 \text{ ft}^2$$

A circle with radius given



$$A = \pi r^2$$

$$A = \pi(5\text{ft.})^2$$

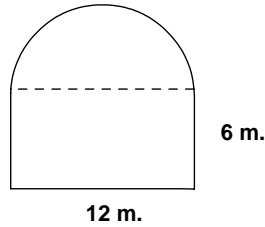
$$A = 25\pi \text{ ft}^2$$

or

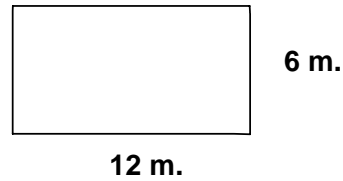
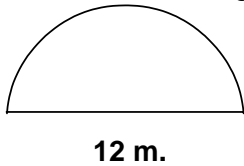
$$A = 78.5 \text{ ft}^2$$

In some instances π is requested in answer.

When finding the area of a composite figure, the sections of the composite figure will be separated into shapes whose areas can be calculated to find the area of the composite figure.



To find the area of the figure represented by the solid lines, the figure could be thought of as a semi-circle and a rectangle as shown below:



The area of the semi-circle is calculated by finding the area of a circle (A_C) with a 6m. radius then dividing the area by 2.

$$A_C = \pi(6\text{m.})^2$$

$$A_C = 36\pi \text{ m}^2 \qquad \frac{1}{2} A_C = 18\pi \text{ m}^2$$

or

or

$$A_C = 113.04 \text{ m}^2 \qquad \frac{1}{2} A_C = 56.52 \text{ m}^2$$

The area of the rectangle (A_R) is calculated by multiplying the length by the width.

$$A_R = (12\text{m.})(6\text{m.})$$

$$A_R = 72 \text{ m}^2$$

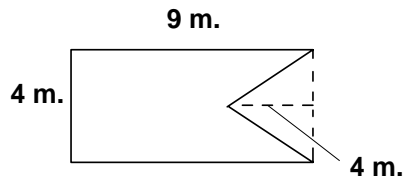
The composite area (A_T) will be the sum of the 2 areas:

$$A_T = \frac{1}{2} A_C + A_R$$

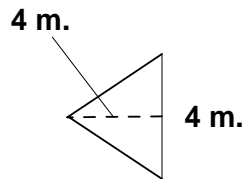
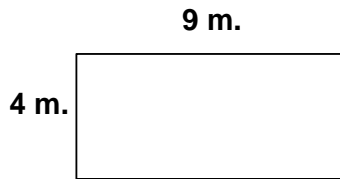
$$A_T = 56.52 \text{ m}^2 + 72 \text{ m}^2$$

$$A_T = 128.52 \text{ m}^2 \qquad \text{or} \qquad A_T = (18\pi + 72) \text{ m}^2$$

A similar approach can be applied to the following composite.



The figure can be thought of a rectangle and a triangle as shown below:



The area of the rectangle (A_R) is calculated by multiplying the length by the width.

$$A_R = (9\text{m.})(4\text{m.})$$

$$A_R = 36\text{m.}^2$$

The Area of the triangle (A_T) is calculated by multiplying the base times the height and dividing by 2.

$$A_T = \frac{(4\text{m.})(4\text{m.})}{2}$$

$$A_T = 8\text{m.}^2$$

The composite area (A_C) will be the area of the rectangle minus the area of the triangle since the triangular section was removed from the rectangle to obtain the composite figure.

$$A_C = A_R - A_T$$

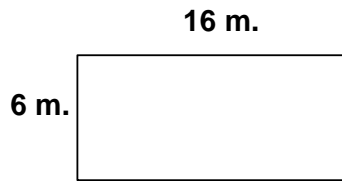
$$A_C = 36\text{m.}^2 - 8\text{m.}^2$$

$$A_C = 28\text{m.}^2$$

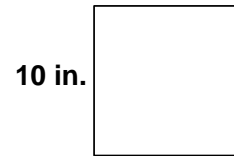
Problem Set 1:

For the figures below, find the area. Use 3.14 for π .

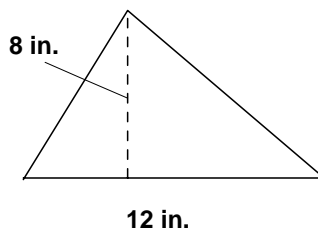
1.



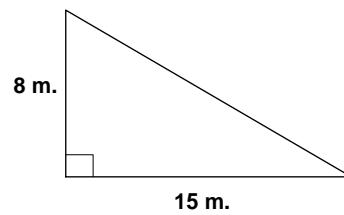
2.



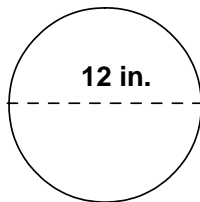
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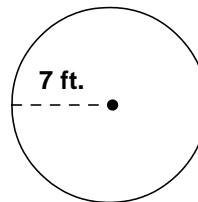
4.



5.



6.

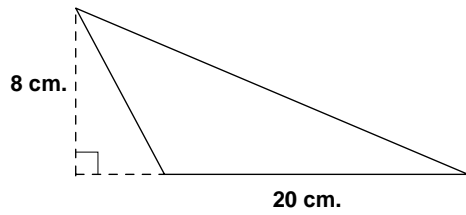


7. Find the area of a sheet of paper $8\frac{1}{2}$ inches by 11 inches.
8. Find the area of a circle with a 24 feet radius.
9. Find the area of a circle with an 18 meter diameter.
10. Find the area of a right triangle with sides that measure 12 m., 16 m., and 20 m..

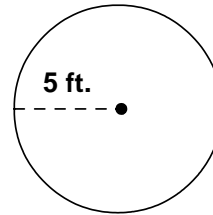
Problem Set 2:

For the figures below, find the area. Use 3.14 for π .

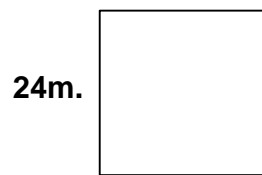
11.



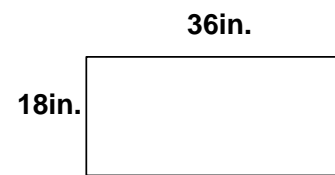
12.



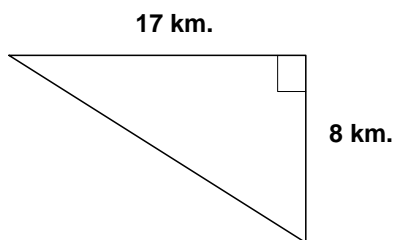
13.



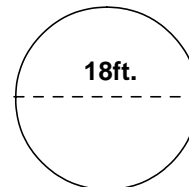
14.



15.



16.

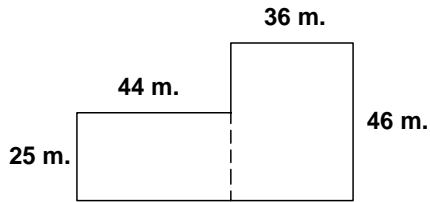


17. Calculate the area of a rectangular lot with side dimensions of 100 feet by 80 feet.
18. Calculate the area of a circle with a 48 meter diameter.
19. Calculate the area of a square yard in square feet.
20. Find the area of a circle with a 130 feet radius.

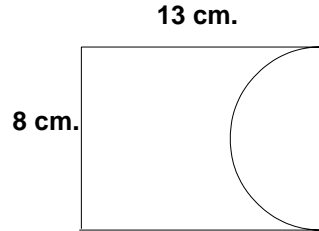
Problem Set 3:

For the figures below find the area. Use 3.14 for π .

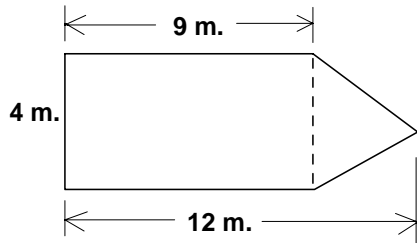
21.



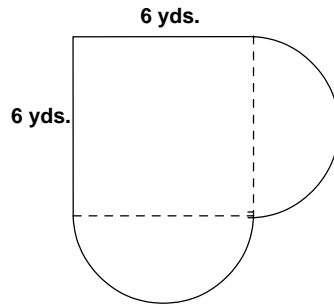
22.



23.



24.



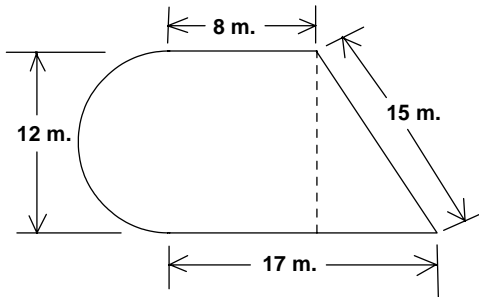
25. A barn measures 150 feet by 90 feet. How many one gallon cans of paint should be purchased to paint the four 12 feet high outside walls, if each gallon of paint covers 1000 square feet?

26. During a normal summer day it has been determined that water evaporates from a lake at the rate of 1 gallon per 10 square feet each hour. If the lake is a 200 feet-wide circle, how many gallons will evaporate in an 8-hour period?

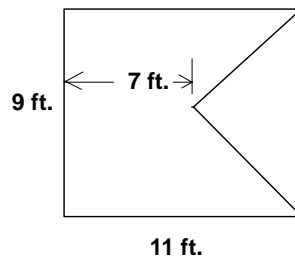
Problem Set 4:

For the figures below find the area. Use 3.14 for π .

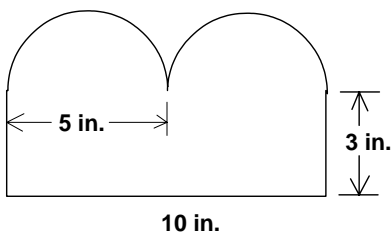
27.



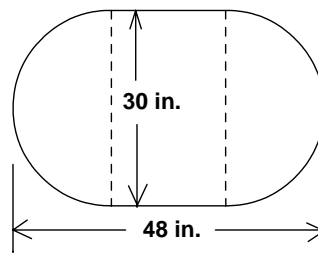
28.



29.



30.



31. How many tiles will be required to make a 4 feet boundary around a pool which measures 20 feet by 60 feet? Each tile measures 1 foot by 2 feet (covers 2 square feet).

32. How many bags of fertilizer should be purchased to fertilize the grass in a yard, which has a 2800 square feet house on a lot that measures 160 feet by 80 feet with a 100 feet long driveway which is 10 feet wide? Each bag covers 1000 square feet.