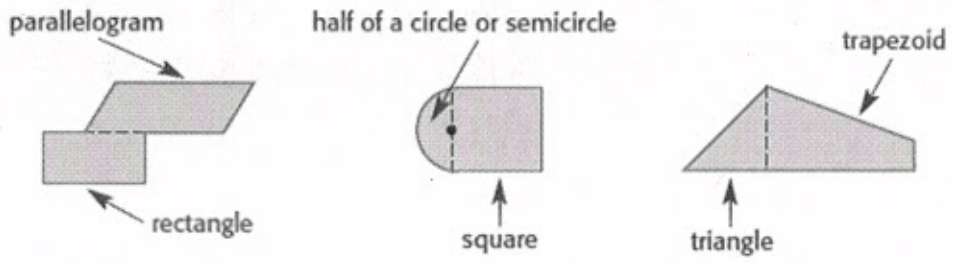
key

Notes 8.5 **Area of Composite Figures**

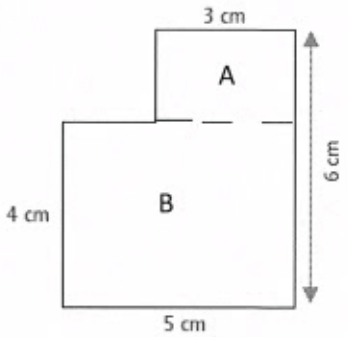
Find the Area of a Composite Figure

A **composite figure** is made up of two or more shapes. To find the area of a composite figure, decompose (separate) 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,	$A = \frac{1}{2}h(b_1 + b_2)$
Circle	The area, A, of a circle is equal to π times the square of the radius, r.	$A = \pi r^2$



Example 1: Find the area of the composite figure.



The figure can be separated into two rectangles.

Rectangle A

$A = l \cdot w$

$A = 3 \cdot 2$

$A = 6 \text{ cm}^2$

Rectangle B

$A = l \cdot w$

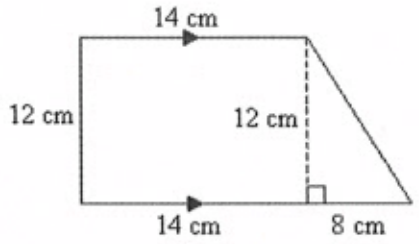
$A = 4 \cdot 5$

$A = 20 \text{ cm}^2$

Total Area = Area A + Area B

Total Area = 6 + 20 = 26 cm^2

Example 2: Find the area of the composite figure.



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

Rectangle

$A = l \cdot w$

$A = 14(12)$

$A = 168\ cm^2$

Triangle

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

$A = \frac{1}{2}(8 \cdot 12)$

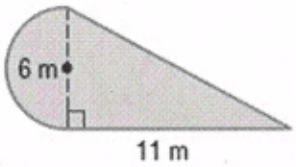
$A = \frac{1}{2}(96)$

$A = 48\ cm^2$

Total Area = 168 + 48

Total Area = 216 cm^2

Exampe 3: Find the area of the composite figure.



The figure can be separated into a semicircle and a triangle. Round to the nearest tenth.

Area of semicircle

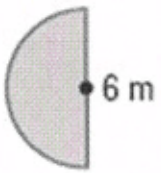
$A = \frac{1}{2}\pi r^2$

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

$A \approx \frac{1}{2} \cdot \pi \cdot 9$

$A \approx 14.137$

$A \approx 14.1\ m^2$

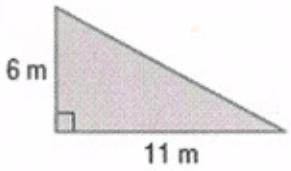


Area of triangle

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

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

$A = 33\ m^2$



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

Try This: The running track is made up of a rectangle and two semicircles. Find the area of the track. Round to the nearest hundredth.

Area of Rectangle

$A = l \cdot w$

$A = 8(7)$

$A = 56\ m^2$

Area of 2 semi-circles (1 circle)

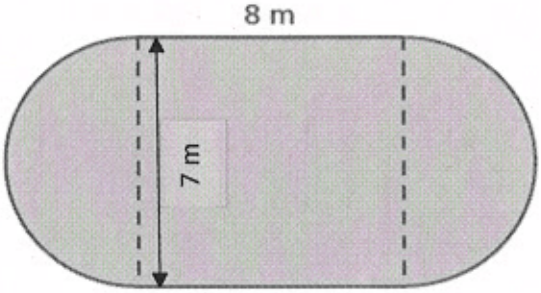
$A = \pi r^2$

$A = \pi(3.5)^2$

$A = \pi(12.25)$

$A \approx 38.484$

$A \approx 38.48\ m^2$



$d = 7$

$r = \frac{d}{2}$

$r = \frac{7}{2}$

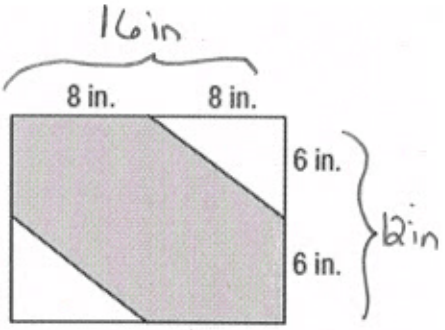
$r = 3.5$ m

Total Area $\approx 56 + 38.48$

Total Area $\approx 94.48\ m^2$

The area of the track is about 94.48 m^2

Example 4: Two congruent triangles are cut from a rectangle. Find the area of the shaded region.



① Large Rectangle

$A = l \cdot w$

$A = 16(12)$

$A = 192 in^2$

② 2 Triangles

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

$A = \frac{1}{2}(8 \cdot 6) \cdot 2$

$A = \frac{1}{2}(48) \cdot 2$

$A = 24 \cdot 2$

$A = 48 in^2$

③ Area of Shaded Region

A = Area of Rectangle - Area of Triangles

$A = 192 - 48$

Area of shaded region = $144 in^2$