5.7 Perimeter and Area of Composite Figures
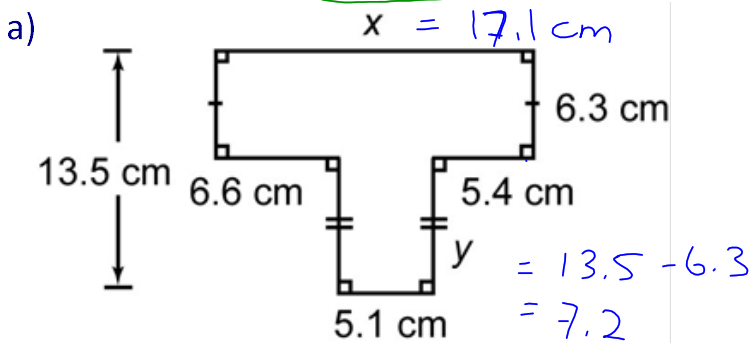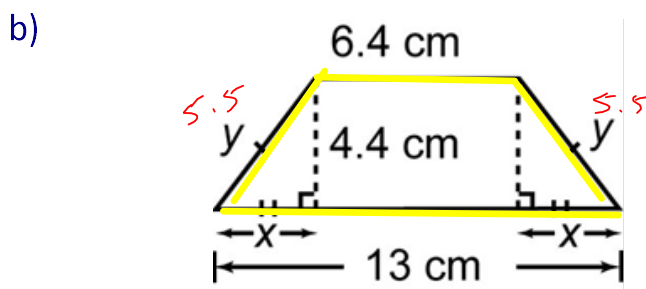
Ex. 1   Determine the perimeter.

A Composite Figure is "composed", or made up of more than one shape.
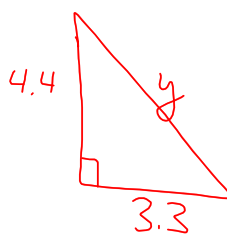
a)

$x = 17.1$ cm

6.3 cm

13.5 cm   6.6 cm   5.4 cm

$y = 13.5 - 6.3$
$= 7.2$

5.1 cm

$P = 17.1 + 6.3 + 5.4 + 7.2 + 5.1 + 7.2 + 6.6 + 6.3$
$= 61.2$ cm

b)

6.4 cm

5.5
y 4.4 cm y 5.5

$\leftarrow x \rightarrow$ $\leftarrow x \rightarrow$
13 cm

$P = 6.4 + 5.5 + 13 + 5.5$
$= 30.4$ cm

$x = \dfrac{13 - 6.4}{2}$

$= 3.3$

4.4 y

3.3

$y^2 = 4.4^2 + 3.3^2$
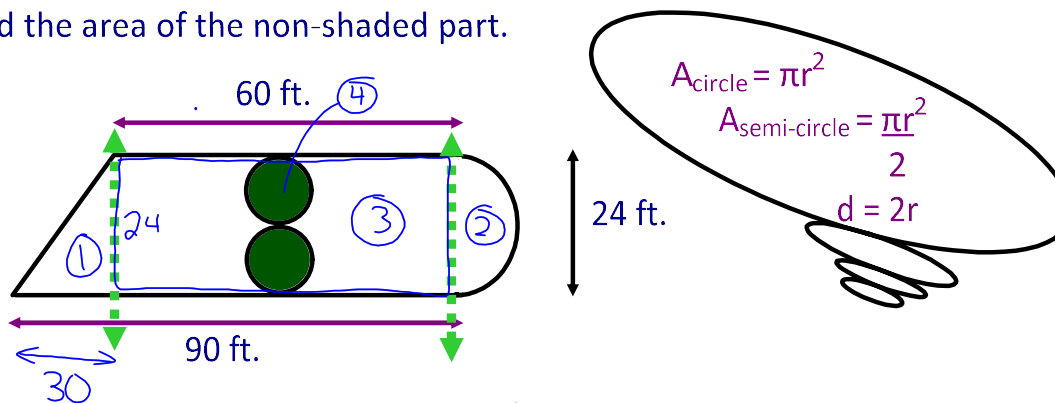$= 10.89 + 19.36$
$= 30.25$
$y = \sqrt{30.25}$
$= 5.5$

TIP of the day: Use a highlighter to outline the perimeter so that you don't add inside pieces!

Ex. 2   Find the area of the non-shaded part.

60 ft. ④

$A_{circle} = \pi r^2$

$A_{semi\text{-}circle} = \dfrac{\pi r^2}{2}$

d = 2r

24

①   ③   ②

24 ft.

90 ft.

30

① $A = \dfrac{30(24)}{2}$
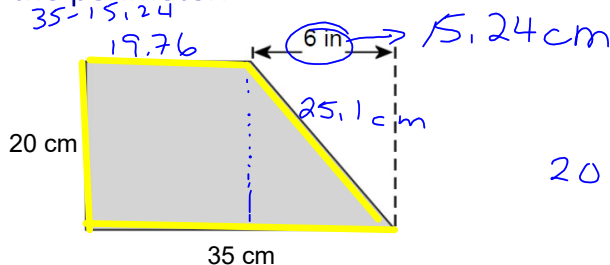$= 360 \text{ ft}^2$

③ $A = \ell \times w$
$= (60)(24)$
$= 1440 \text{ ft}^2$

② $A = \dfrac{\pi r^2}{2}$ $d = 24$
$\therefore r = 12$
$= \dfrac{\pi (12)^2}{2}$
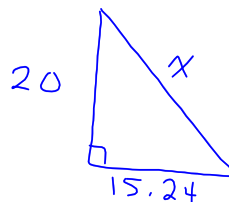$\doteq 226.1 \text{ ft}^2$

④ 2 circles, radius 6
$A = \pi r^2$
$= \pi (6)^2$
$= 113.1 \text{ ft}^2 \leftarrow$ each

<u>All</u>
$A = ① + ② + ③ - ④ - ④$
$= 360 + 226.1 + 1440 - 113.1 - 113.1$
$= 1800 \text{ ft}^2$

Ex. 3   Find the perimeter.

35 - 15.24
19.76
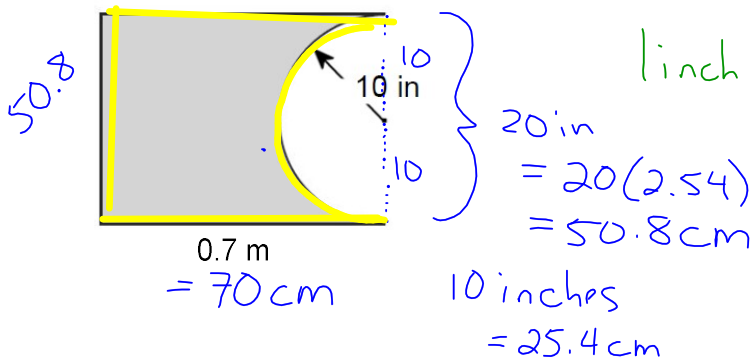
6 in → 15.24 cm

25.1 cm

20 cm

35 cm

20

x

15.24

$P = 20 + 19.76 + 25.1 + 35$
$= 99.86 \text{ cm}$

$x^2 = 15.24^2 + 20^2$
$x^2 = 232.26 + 400$
$x^2 = 632.26$
$x = \sqrt{632.26}$
$\doteq 25.1 \text{ cm}$

Ex. 4 Find the perimeter of the shaded region.

> Perimeter of a circle is called circumference.

50.8

10 in
10

10

20 in
= 20(2.54)
= 50.8 cm

10 inches
= 25.4 cm

0.7 m
= 70 cm

1 inch = 2.54 cm

$P = 50.8 + 70 + 70 + 79.8$
$= 270.6$ cm

Whole Circle
$C = 2\pi r$

Half Circle
$C = \frac{1}{2} 2\pi r$
$= \pi r$

Actual Circumference
$C = \pi(25.4)$
$\doteq 79.8$ cm

Ex. 5 Find the area of the shaded region.

2"
= 2 × 2.54
= 5.08 cm

3" 7.62

3" = 3 × 2.54
= 7.62 cm

5.08 cm

2"

3 cm
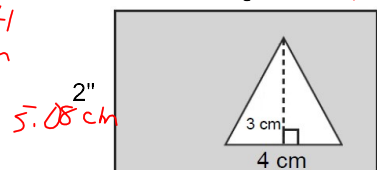
4 cm

$A = A_{RECT} - A_{TRI}$
$= 38.71 - 6$
$= 32.71$ cm^2

$A_{RECT} = l \times w$
$= 5.08 \times 7.62$
$\doteq 38.71$ cm^2

$A_{TRI} = \frac{b \cdot h}{2}$
$= \frac{3 \cdot 4}{2}$
$= 6$ cm^2

Did you notice? Perimeter is linear... degree 1 (cm, m, mL, etc.)
Area is quadratic... degree 2 (cm^2, etc.)