MTH1W Grade 9 Mathematics

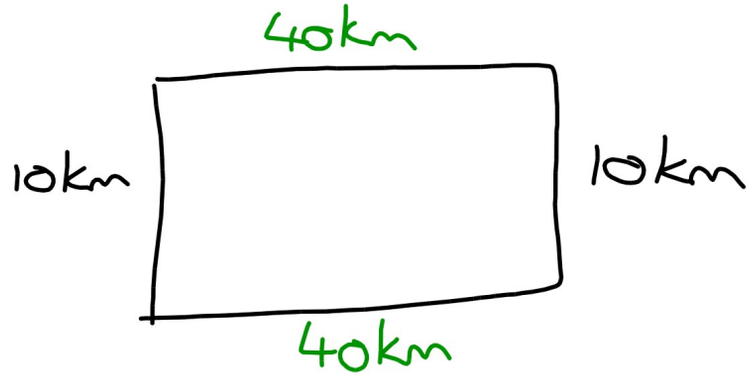
6.1 Measurement Calculations in Two Dimensions

Goal(s) *- To determine the area and perimeter of 2-dimensional shapes*

- Solve problems involving composite figures

A bike path has been constructed around a rectangular park. The park has a width of ***10 km***. The park's length is ***4*** times its width.

How far would you bike if you rode the entire path?



$P = l + w + l + w$

$P = 40 + 10 + 40 + 10$

$P = 100\ km$

In preparation for winter, the City needs to apply fertilizer to the park. One bag of fertilizer costs **$13.50** and covers ***2.75 m²***. How much will it cost to fertilize the entire park?

$A = l \times w$

$A = 40{,}000 \times 10{,}000$

$A = 400{,}000{,}000\ m^2$

$\$13.50$ to cover $2.75 m^2$

$\Rightarrow \frac{\$13.50}{2.75} = \$4.91$ to cover $1 m^2$

Total cost $= 400{,}000{,}000 \times \$4.91$

$= \$1{,}964{,}000{,}000$

Remember...

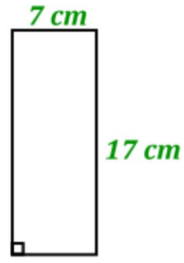
Perimeter

- the distance around the outside of a shape
- to calculate, add up the lengths of each of all the outside edges

Area

- the amount of space taken up by a 2D shape.
- use the shape specific formula to calculate - make sure to substitute the correct dimensions into the formulas!

Determine the area and perimeter.



Area = length x width

$A = 17 \times 7$

$A = 119\ cm^2$

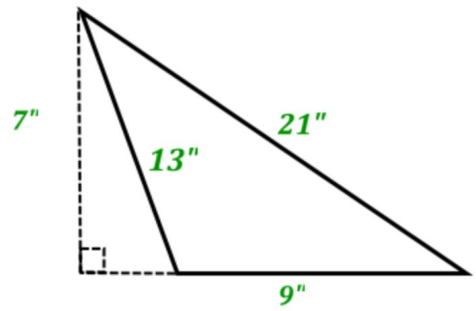
$P = 2l + 2w$

$P = 2(17) + 2(7)$

$P = 34 + 14$

$P = 48\ cm$

Determine the area and perimeter.



$P = 9 + 13 + 21$

$P = 43$ "

inches

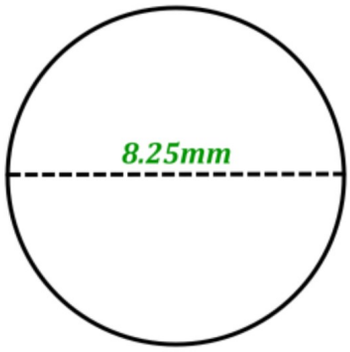
$A = \frac{b \times h}{2}$

$A = \frac{9 \times 7}{2}$

$A = \frac{63}{2}$

$A = 31.5\ in^2$

Determine the area and perimeter.



Perimeter = Circumference

$C = \pi d$

$C = \pi \times 8.25$

$C = 25.9\ mm$

$radius = \frac{diameter}{2}$

$r = \frac{8.25}{2}$

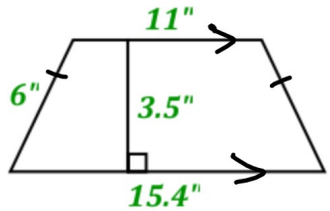
$r = 4.125mm$

$A = \pi r^2$

$A = \pi \times 4.125^2$

$A = 53.5mm^2$

Determine the area and perimeter.



$P = 6 + 11 + 6 + 15.4$

$P = 38.4$ inches

$A = \frac{(a+b)h}{2}$

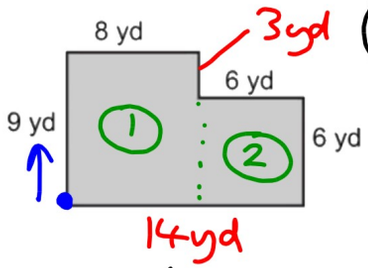
$A = \frac{(11+15.4) \times 3.5}{2}$

$A = \frac{26.4 \times 3.5}{2}$

$A = 46.2\ in^2$

The perimeter and area of a **composite** 2D shape can be found by breaking the shape into known shapes and using the appropriate formulas.

Determine the **area** and **perimeter** of the following shape.



$P = 9+8+3+6+6+14$

$P = 46\ yd$

$Area = A_1 + A_2$

$A = (9\times8) + (6\times6)$

$A = 72 + 36$

$A = 108\ yd^2$