IB Math Studies 2 – Bell Work

For the points $P(1, -3)$ and $Q(-4, 0)$, find:

a the distance between P and Q

b the gradient of PQ

c the equation of the line passing through P and Q.

a. $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

$d = \sqrt{(-4-1)^2 + (0+3)^2}$

$d = \sqrt{34}$

$d = 5.83$

b. $\frac{y_2 - y_1}{x_2 - x_1}$

$\frac{0 - -3}{-4-1} = \frac{-3}{5}$

c. $\frac{y-0}{x+4} = \frac{-3}{5}$

$-3x - 12 = 5y - 0$

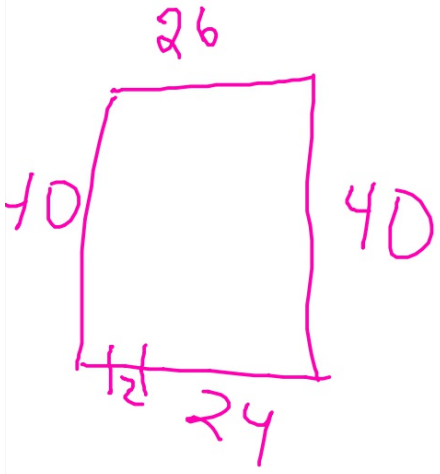
$y = -\frac{3}{5}x - \frac{12}{5}$

Questions on the assignment due today?

Exercises:

14A # 3, 4, 6

14B # 4, 6, 9



130 m

× 5

650 m wire

66 posts

650(0.34)

+ 66(11.95)

€1009.70

Chapter 14

Perimeter, area, and volume

A Conversion of units
B Perimeter
C Area
D Surface area
E Volume
F Capacity
G Density (Extension)
H Harder applications

Syllabus reference: 1.4, 5.5

C AREA

The **area** of a closed figure is the number of square units it contains.

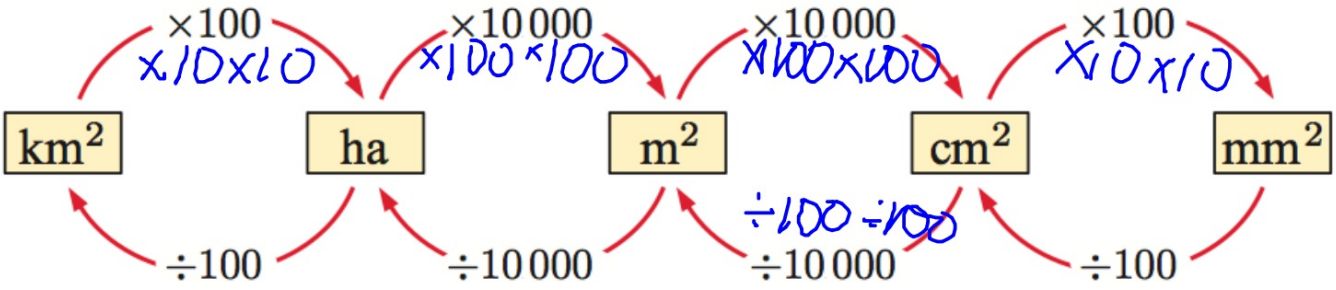
The most common units of area are the squares of the length units:

- **square millimetres** (mm^2)
- **square centimetres** (cm^2)
- **square metres** (m^2)
- **square kilometres** (km^2).

For larger areas we must also use **hectares** (ha).

Area conversions:

$$
\begin{aligned}
1\ \text{cm}^2 &= 10\ \text{mm} \times 10\ \text{mm} &&= 100\ \text{mm}^2 \\
1\ \text{m}^2 &= 100\ \text{cm} \times 100\ \text{cm} &&= 10\,000\ \text{cm}^2 \\
1\ \text{ha} &= 100\ \text{m} \times 100\ \text{m} &&= 10\,000\ \text{m}^2 \\
1\ \text{km}^2 &= 1000\ \text{m} \times 1000\ \text{m} &&= 1\,000\,000\ \text{m}^2 \text{ or } 100\ \text{ha}
\end{aligned}
$$



Convert:

a $560\ \text{cm}^2$ to m^2

b $4.8\ \text{km}^2$ to ha

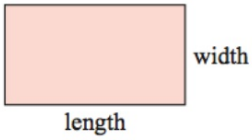
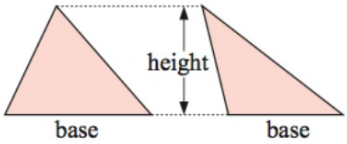
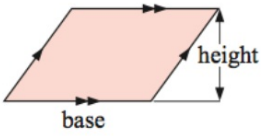
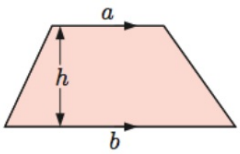
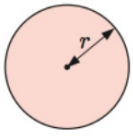
In my city there are around 56 800 houses built on 4800 hectares of land. Find, in square metres, the average lot size for a house.

$4800\ ha = 48{,}000{,}000\ m^2$

$\times 100 \times 100$

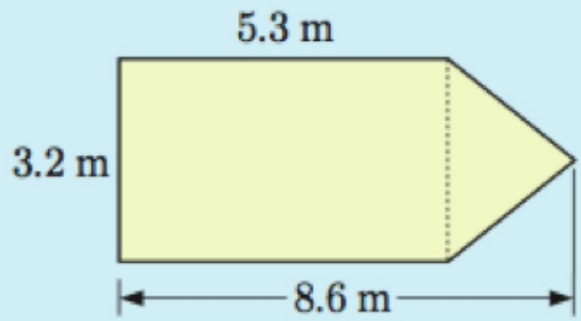
$\frac{48{,}000{,}000}{56\,800} = 845\ m^2/house$

AREA FORMULAE

Shape	*Figure*	*Formula*
Rectangle		**Area = length × width**
Triangle		**Area = $\frac{1}{2}$ × base × height** DEMO
Parallelogram		**Area = base × height** DEMO
Trapezium		**Area = $\left(\frac{a+b}{2}\right) \times h$** DEMO
Circle		**Area = πr^2** DEMO

Calculate the shaded area:

a



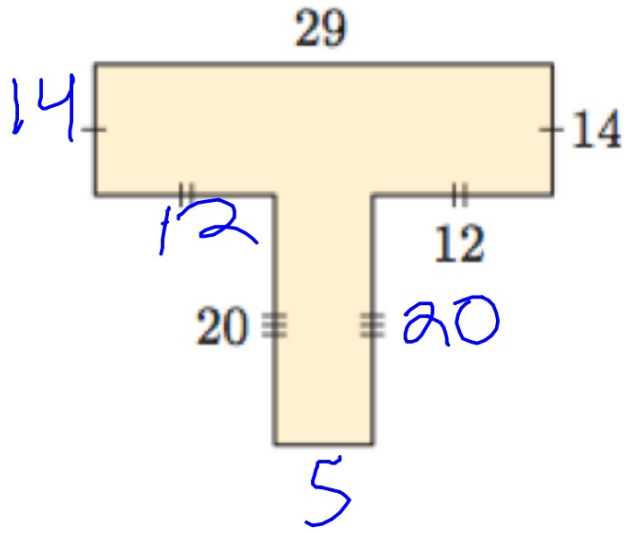
a) $5.3 \times 3.2 = 16.96$

$8.6 - 5.3 = 3.3$

$3.3 \times 3.2 = 10.56 / 2 = 5.28 + 16.96 =$

$22.24 m^2$

Calculate the area of the following composite shapes.
All measurements are given in cm.



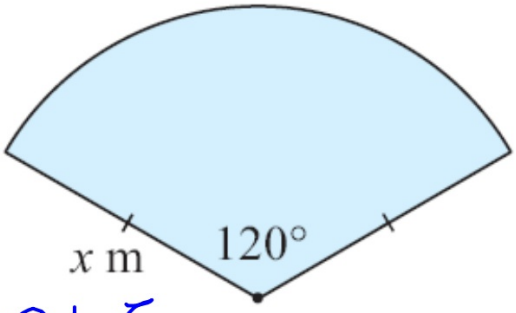
$l \times h = 14 \times 29 =$
406

$20 \times 5 = 100$

506 cm^2

Give an expression for the area of the shaded region.

b



$r = x$

πr^2

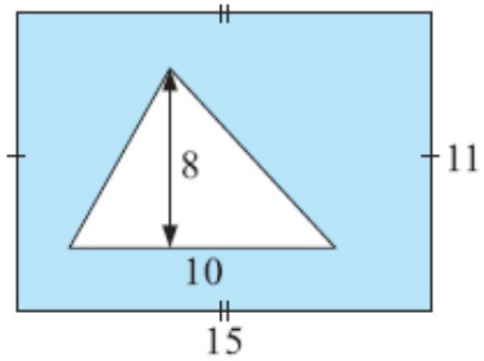
πx^2

$\frac{120}{360} = \frac{1}{3}$

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

3 Calculate the area, in cm^2, of the following shaded regions, if all lengths are in cm.

a

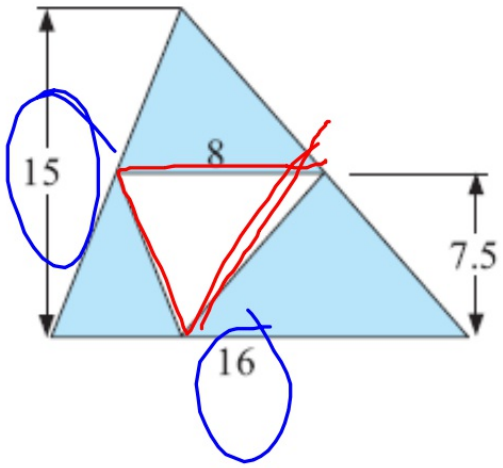


$5(16)(15) = 120$

$5(7.5)(8) = 30$

$120 - 30 = 90\ cm^2$

c



Assignment, from the book:

Exercises:
14C.1 #1a-c
14C.2 #2c,d, 5c, 7, 10