**1.** (a) Find the value of $81^{-\frac{1}{2}}$

$x^{-a} = \frac{1}{x^a}$ . $x^{\frac{a}{b}} = \left(\sqrt[b]{x}\right)^a$

$81^{-\frac{1}{2}} = \frac{1}{81^{\frac{1}{2}}} = \frac{1}{\left(\sqrt{81}\right)^1} = \frac{1}{9^1} = \frac{1}{9}$

$\frac{1}{9}$

**(2)**

(b) Find the value of $\left(\frac{64}{125}\right)^{\frac{2}{3}}$

$x^{\frac{a}{b}} = \left(\sqrt[b]{x}\right)^a$ . $\left(\frac{x}{y}\right)^a = \frac{x^a}{y^a}$

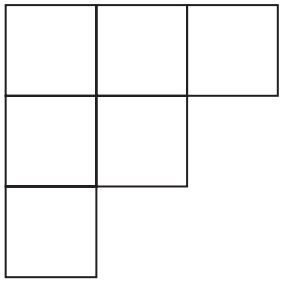
$\left(\frac{64}{125}\right)^{2/3} = \frac{64^{2/3}}{125^{2/3}} = \frac{\left(\sqrt[3]{64}\right)^2}{\left(\sqrt[3]{125}\right)^2} = \frac{4^2}{5^2} = \frac{16}{25}$

$\frac{16}{25}$.

**(2)**

**(Total for Question is 4 marks)**

**2.** The diagram shows a shape made from 6 identical squares.



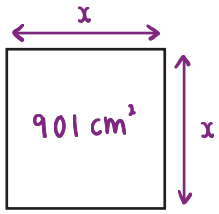
The total area of the shape is 5406 $cm^2$

(a) Find an estimate for the length of one side of each square.
Give your answer correct to the nearest whole number.

Area of one square :

$5406 \div 6 = 901\ cm^2$ (1)

Find length of one side :




$(x)(x) = 901$

$x^2 = 901$

$x = \sqrt{901}$

$x \approx \sqrt{900}$ (1)

$\approx$ 30 cm (to the nearest whole)

(1)

30 cm

**(3)**

(b) Is your answer to part (a) an underestimate or an overestimate?
You must give a reason for your answer.

Underestimate because the length was rounded down. (1)

**(1)**

**(Total for Question is 4 marks)**