

Fit for Photocopying

Q1 What scale factor of enlargement would you need to scale A4 to A3, A2, A1 and A0?

area of $A_i = f(i)$

$$\therefore f(3) = f(4) \times 2,$$

$$f(2) = f(4) \times 4,$$

$$f(1) = f(4) \times 8 \text{ and}$$

$$f(0) = f(4) \times 16.$$

Q2 What happens if you started at A5 instead of A4?

$$f(4) = f(5) \times 2,$$

$$f(3) = f(5) \times 4,$$

$$f(2) = f(5) \times 8,$$

$$f(1) = f(5) \times 16 \text{ and}$$

$$f(0) = f(5) \times 32$$

Q3 What would the scale factors be if you scaled from the larger to the smaller ones?

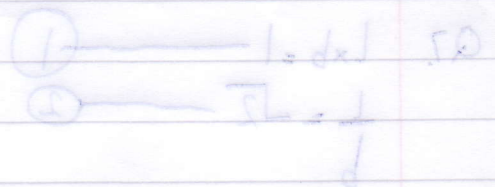
the scale from the smaller to larger.

Q4 $A_m \rightarrow A_n$

$$f(m) = f(n) \times 2^{n-m}$$

Q5 $A3 \rightarrow A4$

50%.

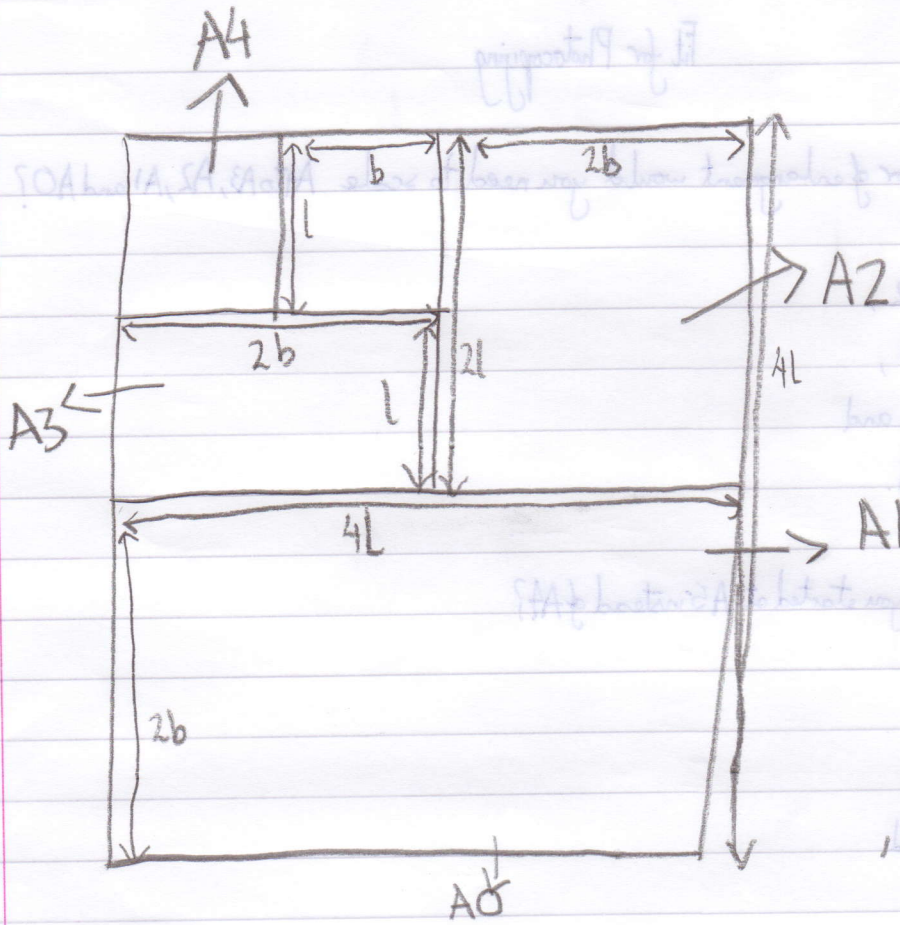


$$\frac{1}{\sqrt{2}} \cdot \frac{1}{d} = d \iff \textcircled{2} = \textcircled{1}$$

$$\frac{1}{\sqrt{2}} = d \times d$$

$$\frac{1}{\sqrt{2}} = \frac{1}{\sqrt{2}} \cdot d$$

Q6.



$$\frac{2b}{l} = \frac{l}{b}$$

$$\text{or } 2b \times b = l \times l$$

$$\text{or } 2b^2 = l^2$$

$$\text{or } \sqrt{2}b = l$$

$$\text{or } \frac{l}{b} = \sqrt{2}$$

Q7. $l \times b = 1$ ——— ①

$\frac{l}{b} = \sqrt{2}$ ——— ②

$$\textcircled{1} \div \textcircled{2} \Rightarrow b = \frac{1}{b} \div \frac{1}{\sqrt{2}}$$

$$\text{or } b \times b = \frac{1}{\sqrt{2}}$$

$$\text{or } b = \left(\frac{1}{\sqrt{2}}\right)^{\frac{1}{2}} = \frac{1}{\sqrt[4]{2}}$$

$$\therefore l = 2^{\frac{1}{4}}$$

Q8 $A_i, (i > 0, i \in \mathbb{R})$ is defined as long as:
 $f(i) \in \mathbb{Z}, f(i) \in \mathbb{R}, f(i) > 0$

Using our rule:

$$f(i) = f(0) 2^{0-i}$$

or $f(i) = f(0) 2^{-i}$ — ③ ①

or $f(i) > f(0)$

$\therefore f(i) > 0$

Also from ③ ①, $f(i) \in \mathbb{R}$

Thus, $f(i) = A^{-1}$ has double the area of A_0 .

Q9 $A_i, i > 0, i \in \mathbb{Z}$ is defined if:
 $f(i) \in \mathbb{R}, f(i) > 0$

According to our rule:

A_{i+1}

$$f(i) = f(0) 2^{0-i}$$

or $f(i) = f(0) 2^{-i}$ — ②

or $f(i) = f(0) \frac{1}{2^i}$

or $f(i) < f(0)$

Also, from ②, $f(i) \in \mathbb{R}$

Thus A_{i+1} has $\frac{1}{\sqrt{2}}$ times more than A_0 's area

$\therefore f(i) > 0$

So, mathematically we can have a rule for fractional values but from a practical point of view we cannot know by exactly how much we need to fold the paper of A to make it A_i , where i is a fraction.