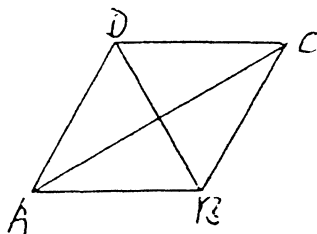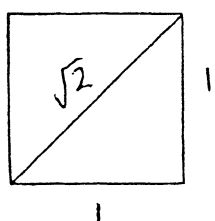### ANSWERS

A) $\sqrt{2} : 1$

B) $3\sqrt{3}/2$

C) 27

A) The shorter diagonal of a rhombus is equal to the diagonal of a square, while the longer diagonal is equal to twice the side of the same square. Calculate in simplified radical form the ratio of the area of the rhombus to the area of the square.
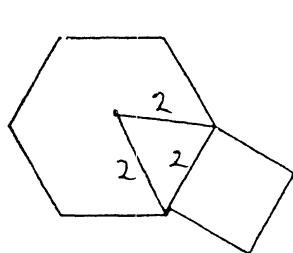

$BD = \sqrt{2}$ Area rhombus $= \frac{1}{2} \cdot 2\sqrt{2} = \sqrt{2}$
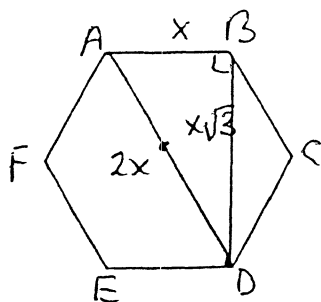
$AC = 2$ Area square $= 1$

ANS $\sqrt{2} : 1$

B) A regular hexagon and a square share a common side. Calculate the ratio in simple radical form of the area of the hexagon to the area of the square.

$$\frac{A_H}{A_s} = \frac{6 \cdot \frac{4\sqrt{3}}{4}}{4} = \frac{6\sqrt{3}}{4} = \frac{3\sqrt{3}}{2}$$

C) In regular hexagon ABCDEF, the area of triangle ABD is 9. Calculate the area of the hexagon.

$\frac{1}{2}x^2\sqrt{3} = 9$, $x^2\sqrt{3} = 18$, $x^2 = 6\sqrt{3}$

$A_H = 6 \cdot \frac{x^2\sqrt{3}}{4} = \frac{6 \cdot 6\sqrt{3}\sqrt{3}}{4} = \frac{36 \cdot 3}{4} = 27$