Problem 23

A rectangular piece of paper whose length is $\sqrt{3}$ times the width has area A. The paper is divided into three equal sections along the opposite lengths, and then a dotted line is drawn from the first divider to the second divider on the opposite side as shown. The paper is then folded flat along this dotted line to create a new shape with area B. What is the ratio $B : A$?

(A) $1 : 2$
(B) $3 : 5$
© $2 : 3$
(D) $3 : 4$
(E) $4 : 5$

146
Problem 21
Trapezoid $ABCD$ has parallel sides $\overline{AB}$ of length 33 and CD of length 21 . The other two sides are of lengths 10 and 14 . The angles at $\overline{A}$ and $\overline{B}$ are acute. What is the length of the shorter diagonal of $ABCD$?
(A) $10\sqrt{6}$
(B) 25
© $8\sqrt{10}$
(D) $18\sqrt{2}$
(E) 26
Problem 22
Eight semicircles line the inside of a square with side length 2 as shown. What is the radius of the circle tangent to all of these semicircles?
(A) $\frac{1+\sqrt{2}}{4}$
(B) $\frac{\sqrt{5}-1}{2}$
© $\frac{\sqrt{3}+1}{4}$
(D) $\frac{2\sqrt{3}}{5}$
(E) $\frac{\sqrt{5}}{3}$

15a
Problem 19
The isosceles right triangle ABC has right angle at C and area 12.5 The rays restricting $\angle ACB$ intersect AB at D and E. What is the area of $\triangle CDE$?
(A) $\frac{5\sqrt{2}}{3}$
(B) $\frac{50\sqrt{3}-75}{4}$
© $\frac{15\sqrt{3}}{8}$
(D) $\frac{50-25\sqrt{3}}{2}$
(E) $\frac{25}{6}$