Solution 182
by Dave Lindell, L.S.

In Figure 1, the altitudes of the equilateral triangles on the 4, 3 and 5 sides are 3.464102, 2.598076 and 4.330127 respectively. The area on the "4" side is \( \frac{\sqrt{3}}{4} \times (3.464102)^2 = 6.928204 \), on the "3" side is \( \frac{\sqrt{3}}{4} \times (2.598076)^2 = 3.897114 \) and on the "5" side is \( \frac{\sqrt{3}}{4} \times (4.330127)^2 = 10.825318 \) which is 6.928204 + 3.897114 = 10.825318.

In Figure 2, the perpendicular distance from the center of the pentagon to the triangle is 2.752764, 2.064573 and 3.440955 respectively to the 4, 3 and 5 side. Each pentagon is made up of five similar triangles. On the "4" side, the area of the pentagon is 5(\( \frac{\sqrt{3}}{4} \))\times (2.752764)^2 = 27.52764, on the "3" side the area of the pentagon is 5(\( \frac{\sqrt{3}}{4} \))\times (2.064573)^2 = 15.48430 and on the "5" side the area of the pentagon is 5(\( \frac{\sqrt{3}}{4} \))\times (3.440955)^2 = 43.01194 which is the same as 27.52764+15.48430=43.01194.

In Figure 3, the areas of the sides' semi-circles are \( \frac{1}{2} \pi (2)^2 = 6.283185 \) and \( \frac{1}{2} \pi (1.5)^2 = 3.534292 \) and that of the semicircle on the hypotenuse is \( \frac{1}{2} \pi (2.5)^2 = 9.817477 \) which is equal to 6.283185+3.534292=9.817477.