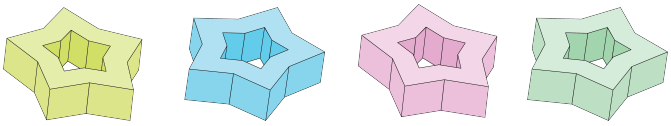
Problem of the Week

Problem B

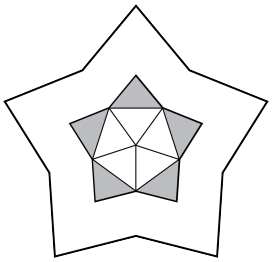
Icy Star Rings

Michel makes coloured ice in the shape of a star ring by pouring coloured water into a special mold and freezing it. Some of his ice stars are shown.

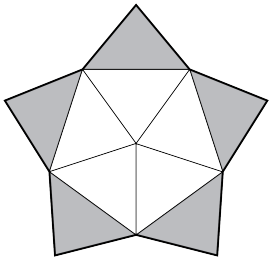


Michel's mold consists of an outer star and an inner star, and water is poured between the inner and outer star walls.

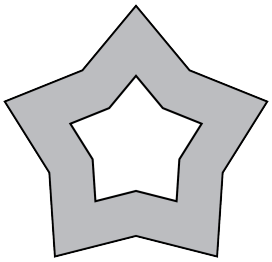
(a) The diagram shows the inner and outer stars from Michel's mold. The inner star is divided into five outer triangles, shown in grey, and five inner triangles, shown in white. The outer triangles each have a base of 3 cm and a height of 1.7 cm. The inner triangles each have a base of 3 cm and a height of 2 cm. Determine the area of the inner star.



(b) If we ignore the inner star, then we can divide the outer star into five outer triangles and five inner triangles, like we did with the inner star in part (a). The base and height of each of the triangles in the outer star are twice the base and height of their corresponding triangle in the inner star. Determine the area of the outer star.



(c) The shaded region represents the area between the inner and outer star walls. Use your calculations from parts (a) and (b) to determine the area of this region.



Theme: Geometry & Measurement