

# Problem Corner

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## 1 Problem 1

Let  $[ABC]$  be any triangle and let  $D$ ,  $E$ , and  $F$  be the reflections of the circumcentre in relation to the three sides. Show that triangles  $[ABC]$  and  $[DEF]$  are congruent.

## 2 Problem 2

Let the quadrilateral  $[ABCD]$  be inscribed in a circle with centre  $R$ , and let a circle with centre  $r$  be inscribed in triangle  $[ABM]$ , where  $M$  is a point on segment  $BD$ . Suppose that the product  $Rr = A$ , and that the side lengths are  $AD = a$ ,  $BC = b$ , and  $AB = c$ . Determine the length of segment  $CD = x$  in terms of  $A$ ,  $a$ ,  $b$ , and  $c$ .

