



## At the back Puzzles

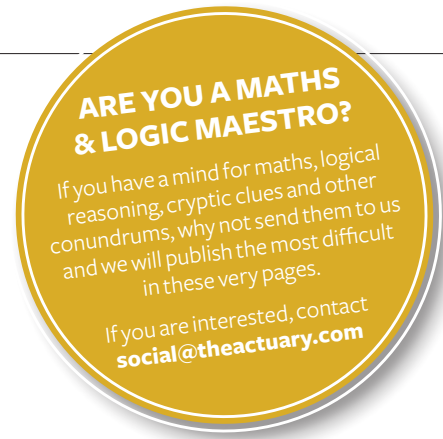
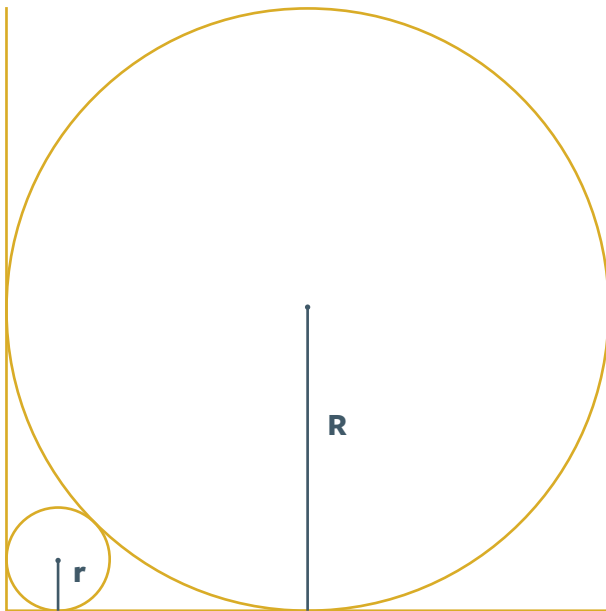
# iq

### Circular logic Member puzzle 03

Courtesy of Dennis Lister, Norwich

A circle, radius  $R$ , is inscribed in a square, tangent to all four sides. A smaller circle, radius  $r$ , is inscribed in one corner of the square, tangent to two sides and to the larger circle.

What is the value of  $R/r$ ?



### Cutting a figure Member puzzle 04

Courtesy of Andrew MacLeod

What numbers should replace the question marks?

1265 4657 9852 3738 2??3

### Next letter Member puzzle 05

Courtesy of Andrew MacLeod

What letter comes next in the following sequence?

N W H O I ?

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### Soap opera Mensa puzzle 795

When soap was in short supply, a family decided to save the last little pieces of leftover soap to form into new bars. They needed nine little pieces to make each new bar.



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Mensa answers: 795: 11. Member puzzle answers - Courtesy of Dennis Lister 03:  $3 + 2(\sqrt{2})$ . Solution: A line from the corner to the centre of the large circle passes through the centre of the small circle and is length  $(\sqrt{2})R$ . Similarly, the length of the line from the corner to the centre of the small circle is  $(\sqrt{2})r$ . So  $(\sqrt{2})R = R + r + (\sqrt{2})r$ . So  $(\sqrt{2})R - R = R + r + (\sqrt{2})r - R$ . So  $(\sqrt{2}-1)R = (1+\sqrt{2})r$ . So  $R/r = (1+\sqrt{2})/(\sqrt{2}-1) = (1+\sqrt{2})(\sqrt{2}+1) = 3 + 2\sqrt{2}$ . Courtesy of Andrew MacLeod 04: 1 and 3. Solution: For each four-digit number, the inner digits are equal to the sum of the squares of the outer digits - eg  $1^2 + 2^2 = 5$  and  $3^2 + 5^2 = 34$ . So the numbers are 1265, 4657, 9852, 3738, 2??3. Solution: These are the second letters of the numbers 1, 2, 3, 4, 5, 6 when written out as words: ONE, TWO, THREE, FOUR, FIVE, SIX.