**Enigmas & puzzles by Barry R Clarke**

**Oh deer!**

Down at the grotto, Santa intends to pose Rudolph a puzzle. Before he arrives, Santa repeatedly throws a traditional dice until the last four throws are such that no two of the four results are identical. This is the four-digit number that Rudolph must deduce.

As Rudolph trots in, Santa gives him four statements about the number: the first digit is odd; the second is prime; the third is even; and the fourth is square. But something is amiss. Dasher, who was present during the throws, waits until Santa leaves the room, then informs Rudolph that exactly two of these four statements are lies.

He gives the following reliable facts about the number:

(a) The second and third digits differ by 3.
(b) The first and fourth total 7.
(c) The sum of the four digits is 12.

**What was Santa’s four-digit number?**

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**The prizes**

**The generalist prize**

One winner who can complete the Generalist word quiz correctly receives a boxset of Mark Forsyth’s bestselling books on words and the English language (Icon Books, £35, hardbacks): *The Etymologicon*, which explores the origins and hidden connections between words; *The Horologicon*, which revives lost words that are apt for modern-day life such as “to snudge”: to stride around as though you’re terribly busy, when in fact you are doing nothing; and *The Elements of Eloquence*, which examines writing style and reveals rhetorical tricks used by everyone from the Ancient Greeks to Katy Perry. “Forsyth is the ancient mariner of all wordsmiths, spinning a never-ending story of unexpected coinages... learned and satisfyingly obscure”—*The Times*

The winner also receives a copy of *Tales of the Marvellous and News of the Strange* (Penguin Classics, £25). This collection of medieval Arabic fantasy tales, at least 1,000 years old, survived in a single manuscript in a library in Istanbul and is translated into English for the first time here.

**The Enigmas & puzzles prize**

One winner who answers both the Enigmas & puzzles questions correctly receives the entire set of Routledge’s “A Citizen’s Guide to Politics and Public Affairs” series (five books, £97.95)—a collection of concise and accessible guides to American politics and the themes that shape political debates, both in the US and Europe, including: deficit and debt; terrorism and counter-terrorism; American foreign policy; the American constitution and Supreme Court; and conservative and liberal ideologies.

The winner also receives copies of *How Adam Smith Can Change Your Life* by Russ Roberts (*Penguin*, £14.99)—which explores the economist’s forgotten work on moral sentiments—and *The Book of 365* by Hugh Brazier and Jan McCann (*Square Peg*, £10.99), a collection of unexpected facts about numbers.

**Plus, win top West End tickets**

One reader who answers everything correctly wins a weekend break in London to see *The Scottsboro Boys*, with a pair of top tickets and an overnight stay at the four-star Cavendish Hotel in Mayfair. The musical, now at the West End’s Garrick Theatre following a sold-out run at the Young Vic, tells the true story of nine black teenagers in 1930s Alabama who were wrongly found guilty at trial by an all-white jury and sentenced to death, in a case that helped spark the modern civil rights movement. Winning high critical acclaim, *The Scottsboro Boys* was nominated for six Olivier Awards and won the Critics’ Circle Award for Best Musical.

“Brave, brilliant and unmissable. I urge you to buy a ticket”—*The Sunday Express* ★★★★★

“The best musical of the year”—*The Times* ★★★★★

Terms and Conditions: Subject to availability. Prize is as stated and cannot be transferred or exchanged. No cash alternative will be offered. Prize valid until 14 February 2014. The overnight stay is comprised of one night’s bed and breakfast at the Cavendish Hotel (www.thecavendish-london.co.uk).

**How to enter**

Send your solutions to answer@prospectmagazine.co.uk or Crossword/Enigmas, Prospect, 35 Sackville Street, London W1S 5AX. Include your email and postal address. All entries must be received by 30th January. Winners will be announced in our February issue. Download a PDF of this page at www.prospectmagazine.co.uk

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**Last month’s generalist solutions**

**Solutions across**

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

**Solutions down**

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

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**Last month’s winner** Peter Gregson, Buckinghamshire

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**Last month’s Enigma solution**

The minimum number of handshakes is 246.

Let there be a Tridems with three arms each and $b$ Quadems with four arms each. For equal numbers of arms $3a = 4b$ so the smallest numbers of guests must be $a = 4$ and $b = 3$. When two Tridems greet there are $3a = 3$ handshakes, two Quadems $4b = 12$. Also there are $a = a = 1/2$ greetings between Tridems, $b(b = 1/2 between Quadems and $ab$ between both tribes. The total number $N$ of handshakes is then $N = 9a(a = 1/2) + 12b + 1b(b = 1)$. The solution arises from $a = 4$ and $b = 3$.

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**Last month’s winner** Andrew Tee, Oxfordshire