

THE SKOLIAD CORNER

No. 19

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The problem set we give in this issue comes to us with our thanks from Tony Gardiner of the UK Mathematics Foundation, School of Mathematics, University of Birmingham. The Nat West Junior Mathematical Challenge was written Tuesday, April 26, 1994 by about 105,000 students. Students from England and Wales must be in school year 8 or below. The use of calculators, calendars, rulers, and measuring instruments was forbidden.

1994 NAT WEST UK JUNIOR MATHEMATICAL CHALLENGE

Tuesday, April 26, 1994 — Time: 1 hour

1. $38 + 47 + 56 + 65 + 74 + 83 + 92$ equals
 A. 425 B. 435 C. 445 D. 456 E. 465.

2. What is the largest possible number of people at a party if no two of them have birthdays in the same month?
 A. 11 B. 12 C. 13 D. 23 E. 334.

3. I have \$500 in 5p coins. How many 5p coins is that?
 A. 100 B. 500 C. 1000 D. 2500 E. 10000.

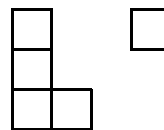
4. What was the precise date exactly sixty days ago today? (No calendars!)
 A. Friday 25th February B. Saturday 26th February
 C. Friday 26th February D. Saturday 27th February
 E. Tuesday 26th February.

5. You have to find a route from *A* to *B* moving horizontally and vertically only, from one square to an adjacent square. Each time you enter a square you add the number in that square to your total. What is the lowest possible total score for a route from *A* to *B*?

3	9	<i>B</i>
8	5	6
9	11	7
<i>A</i>	8	10

 A. 28 B. 29 C. 30 D. 31 E. 34.

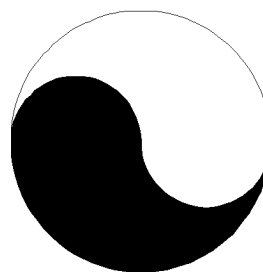
6. On a clock face, how big is the angle between the lines joining the centre to the 2 O'clock and the 7 O'clock marks?
 A. 160° B. 150° C. 140° D. 130° E. 120° .
7. Gill is just six and boasts that she can count up to 100. However, she often mixes up nineteen and ninety, and so jumps straight from nineteen to ninety one. How many numbers does she miss out when she does this?
 A. 70 B. 71 C. 72 D. 78 E. 89.
8. In how many ways can you join the two shapes shown here to make a figure with a line of symmetry?
 A. 0 B. 1 C. 2 D. 3 E. 4.



9. If you divide 98765432 by 8, which non-zero digit does not appear in your answer?
 A. 2 B. 4 C. 6 D. 8 E. 9.
10. How many numbers between 20 and 30 (inclusive) cannot be written as a multiple of 5, or as a multiple of 7, or as the sum of a multiple of 5 and a multiple of 7?
 A. 1 B. 2 C. 3 D. 5 E. 6.

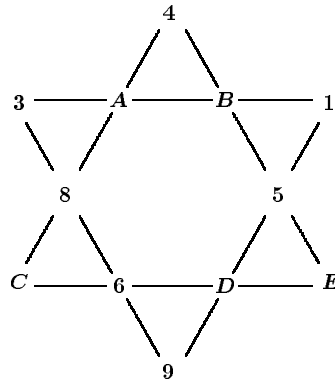
11. Four children are arguing over a broken vase. Barbara says Claire broke it. Claire says Barbara broke it. Only the guilty child is telling the truth.
 A. Alex B. Barbara C. Claire D. David

12. The diagram is made up of a large circle and two semicircles. Which region — the black region and the large circle — has the longest perimeter?



- A. the black region B. the circle C. the white region
 D. black and white are equal and longest
 E. all three perimeters are equal.

13. From my house the church spire is in the direction NNE. If I face in this direction and then turn anticlockwise through 135° I can see the Town Hall clock. In which direction am I then facing?
 A. WSW B. due West C. SW D. due South E. SSE.
14. Samantha bought seven super strawberry swizzles and ten tongue twisting toffees for \$1.43. Sharanpal bought five super strawberry swizzles and ten tongue twisting toffees for \$1.25. How much is one tongue twisting toffee?
 A. 7p B. 8p C. 9p D. 10p E. 18p.
15. I am forty eight years, forty eight months, forty eight weeks, forty eight days and forty eight hours old. How old am I?
 A. 48 B. 50 C. 51 D. 52 E. 53.
16. The numbers 1 to 12 are to be placed so that the sum of the four numbers in each of the six rows is the same. Where must the 7 go?



- A. at A B. at B C. at C D. at D E. at E
17. Three hedgehogs — Roland, Spike and Percival — have a leaf collecting race. Roland collects twice as many as Percival, who collects one and a half times as many as Spike. (Spike is moulting, and so has fewer prickles for her to stick the leaves onto.) Between them they collect 198 leaves. How many did Spike manage to collect?
 A. 18 B. 22 C. 36 D. 44 E. 66.

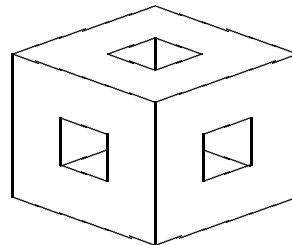
- 18.** The four digits 1, 2, 3, 4 are written in increasing order. You must insert one plus sign and one minus sign between the 1 and the 2, or between the 2 and the 3, or between the 3 and the 4, to produce expressions with different answers. For example,

$$1 - 23 + 4 \text{ gives the answer } -18.$$

How many different *positive* answers can be obtained in this way?

- A. 2 B. 3 C. 4 D. 5 E. 6.
- 19.** Roger Rabbit has twice as many sisters as brothers. His sister Raquel notices that $\frac{2}{5}$ of her brothers and sisters are boys. How many Rabbit children are there in the family?
- A. 2 B. 4 C. 8 D. 16 E. 32.
- 20.** The population of a new town in 1990 was 10,000. It has since doubled every year. If it kept on doubling every year for ten years, what would its population be in the year 2000?
- A. 100,000 B. 200,000 C. 1,000,000 D. 2,000,000 E. 10,000,000.
- 21.** $LMNO$ is a square. P is a point inside the square such that NOP is an equilateral triangle. How big is the angle PMN ?
- A. 75° B. 70° C. 60° D. 45° E. 30° .
- 22.** If the perimeter of a rectangle is $16x + 18$ and its width is $2x + 6$, what is its length?
- A. $18x + 24$ B. $7x + 6$ C. $12x + 6$ D. $6x + 3$ E. $14x + 12$.
- 23.** In a group of fifty girls each one is either blonde or brunette and is either blue-eyed or brown-eyed. Fourteen are blue-eyed blondes, thirty one are brunettes and eighteen are brown-eyed. How many are brown-eyed brunettes?
- A. 5 B. 7 C. 9 D. 13 E. 18.
- 24.** A bottle of *Jungle Monster Crush* (*JMC*) makes enough drink to fill sixty glasses when it is diluted in the ratio 1 part *Crush* to 4 parts water. How many glasses of drink would a bottle of *JMC* make if it is diluted in the ratio 1 part *Crush* to 5 parts water?
- A. 48 B. 60 C. 72 D. 75 E. 80.

25. A 3 by 3 by 3 cube has three holes, each with a 1 by 1 cross section running from the centre of each face to the centre of the opposite face. What is the total surface area of the resulting solid?



- A. 24 B. 48 C. 72 D. 78 E. 84.

That completes the Skoliad Corner for this issue. Send me your contests, suggestions, and recommendations to improve this feature.

Introducing the new Associate Editor-in-Chief

For those of you who do not know Clayton, here is a short profile:

Born:	Haystack, Newfoundland ¹
Educated	Haystack School School, Newfoundland Thornlea School, Newfoundland Memorial University of Newfoundland Queen's University, Kingston, Ontario
Employment	Random South School Board, Trinity Bay, Newfoundland Memorial University of Newfoundland
Mathematical Interests	Mathematical Education Commutative Algebra

¹ You may have difficulty finding Haystack on a map of Newfoundland — it is not lost — it no longer exists!
