



Anniversary
1963 – 1998

35th Canadian Mathematics Competition

An activity of The Centre for Education
in Mathematics and Computing,
University of Waterloo, Waterloo, Ontario

Pascal Contest (Grade 9)

Wednesday, February 18, 1998

C.M.C. Sponsors:



C.M.C. Supporters:



C.M.C. Contributors:

The Great-West
Life Assurance
Company

Northern Telecom
(Nortel)

Manulife
Financial

Equitable Life
of Canada

Time: 1 hour

© 1998 Waterloo Mathematics Foundation

Calculators are permitted, providing they are non-programmable and without graphic displays.

Instructions

1. Do not open the contest booklet until you are told to do so.
2. You may use rulers, compasses and paper for rough work.
3. Be sure that you understand the coding system for your response form. If you are not sure, ask your teacher to clarify it. All coding must be done with a pencil, preferably HB. Fill in circles completely.
4. On your response form, print your school name, city/town, and province in the box in the upper right corner.
5. **Be certain that you code your name, age, sex, grade, and the contest you are writing on the response form. Only those who do so can be counted as official contestants.**
6. This is a multiple-choice test. Each question is followed by five possible answers marked **A, B, C, D,** and **E.** Only one of these is correct. When you have decided on your choice, fill in the appropriate circles on the response form.
7. Scoring: Each correct answer is worth 5 credits in Part A, 6 credits in Part B, and 8 credits in Part C.
There is *no penalty* for an incorrect answer.
Each unanswered question is worth 2 credits, to a maximum of 20 credits.
8. Diagrams are *not* drawn to scale. They are intended as aids only.
9. When your supervisor instructs you to begin, you will have *sixty* minutes of working time.

Scoring: There is *no penalty* for an incorrect answer.

Each unanswered question is worth 2 credits, to a maximum of 20 credits.

Part A: Each question is worth 5 credits.

1. The value of $\frac{1+3+5}{10+6+2}$ is

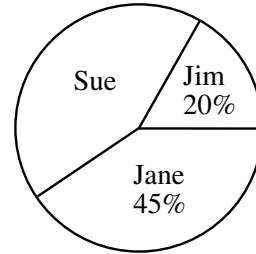
- (A) $\frac{1}{6}$ (B) 2 (C) $\frac{1}{2}$ (D) $1\frac{1}{2}$ (E) $3\frac{1}{10}$

2. If $3(x-5) = 3(18-5)$, then x is

- (A) $\frac{44}{3}$ (B) $\frac{32}{3}$ (C) 9 (D) 18 (E) 81

3. The pie chart shows a percentage breakdown of 1000 votes in a student election. How many votes did Sue receive?

- (A) 550 (B) 350 (C) 330
(D) 450 (E) 935



4. The value of $(\sqrt{169} - \sqrt{25})^2$ is

- (A) 64 (B) 8 (C) 16 (D) 144 (E) 12

5. The value of $\frac{5^6 \times 5^9 \times 5}{5^3}$ is

- (A) 5^{18} (B) 25^{18} (C) 5^{13} (D) 25^{13} (E) 5^{51}

6. If $x = 3$, which of the following expressions is an even number?

- (A) $9x$ (B) x^3 (C) $2(x^2 + 9)$ (D) $2x^2 + 9$ (E) $3x^2$

7. The value of $490 - 491 + 492 - 493 + 494 - 495 + \dots - 509 + 510$ is

- (A) 500 (B) -10 (C) -11 (D) 499 (E) 510

8. The average (mean) of a list of 10 numbers is 0. If 72 and -12 are added to the list, the new average will be

- (A) 30 (B) 6 (C) 0 (D) 60 (E) 5

9. What is one-half of 1.2×10^{30} ?

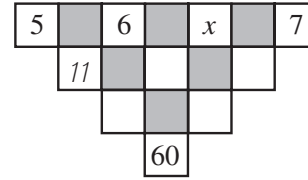
- (A) 6.0×10^{30} (B) 6.0×10^{29} (C) 0.6×5^{30} (D) 1.2×10^{15} (E) 1.2×5^{30}

10. If $x + y + z = 25$ and $y + z = 14$, then x is

- (A) 8 (B) 11 (C) 6 (D) -6 (E) 31

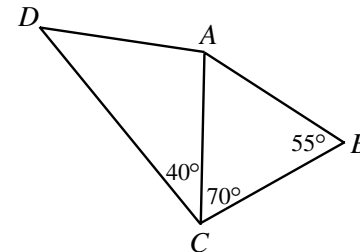
Part B: Each question is worth 6 credits.

11. The number in an unshaded square is obtained by adding the numbers connected to it from the row above. (The '11' is one such number.) The value of x is



- (A) 4 (B) 6 (C) 9
(D) 15 (E) 10

12. In the diagram, $DA = CB$. What is the measure of $\angle DAC$?



- (A) 70° (B) 100° (C) 95°
(D) 125° (E) 110°

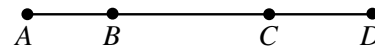
13. A three-wheeled vehicle travels 100 km. Two spare wheels are available. Each of the five wheels is used for the same distance during the trip. For how many kilometres is each wheel used?

- (A) 20 (B) 25 (C) $33\frac{1}{3}$ (D) 50 (E) 60

14. The sum of the digits of a five-digit positive integer is 2. (A five-digit integer cannot start with zero.) The number of such integers is

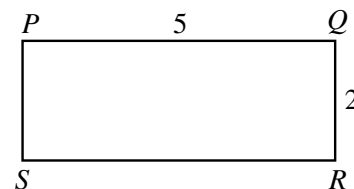
- (A) 1 (B) 2 (C) 3 (D) 4 (E) 5

15. Four points are on a line segment, as shown.
If $AB : BC = 1 : 2$ and $BC : CD = 8 : 5$, then $AB : BD$ equals



- (A) 4 : 13 (B) 1 : 13 (C) 1 : 7
(D) 3 : 13 (E) 4 : 17

16. On a rectangular table 5 units long and 2 units wide, a ball is rolled from point P at an angle of 45° to PQ and bounces off SR . The ball continues to bounce off the sides at 45° until it reaches S . How many bounces of the ball are required?

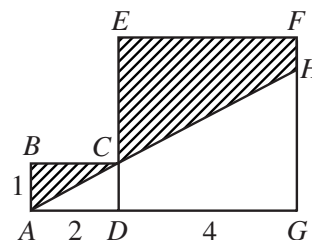


- (A) 9 (B) 8 (C) 7
(D) 5 (E) 4

17. If $1998 = p^s q^t r^u$, where p , q and r are prime numbers, what is the value of $p + q + r$?

- (A) 222 (B) 48 (C) 42 (D) 66 (E) 122

18. In the diagram, $DEFG$ is a square and $ABCD$ is a rectangle. A straight line is drawn from A , passes through C and meets FG at H . The area of the shaded region is



- (A) 8 (B) 8.5 (C) 10
(D) 9 (E) 10.5

