Canadian Mathematics Competition

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

Gauss Contest (Grade 7)

(Grade 8 Contest is on the reverse side)

Wednesday, May 14, 2003

Time: 1 hour

Calculators are permitted.

Instructions

1. Do not open the examination booklet until you are told to do so.
2. You may use rulers, compasses and paper for rough work.
3. Be certain that you understand the coding system for your answer sheet. If you are not sure, ask your teacher to explain it.
4. 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, enter the appropriate letter on your answer sheet for that question.
5. Scoring:
   Each correct answer is worth 5 in Part A, 6 in Part B, and 8 in Part C.
   There is *no penalty* for an incorrect answer.
   Each unanswered question is worth 2, to a maximum of 10 unanswered questions.
6. Diagrams are *not* drawn to scale. They are intended as aids only.
7. When your supervisor tells you to start, you will have *sixty* minutes of working time.

Grade 7

Scoring:	There is *no penalty* for an incorrect answer. Each unanswered question is worth 2, to a maximum of 10 unanswered questions.

Part A: Each correct answer is worth 5.

1. 3.26×1.5 equals

   (**A**) 0.489 (**B**) 4.89 (**C**) 48.9 (**D**) 489 (**E**) 4890

2. The value of $(9-2)-(4-1)$ is

   (**A**) 2 (**B**) 3 (**C**) 4 (**D**) 6 (**E**) 10

3. The value of $30 + 80\,000 + 700 + 60$ is

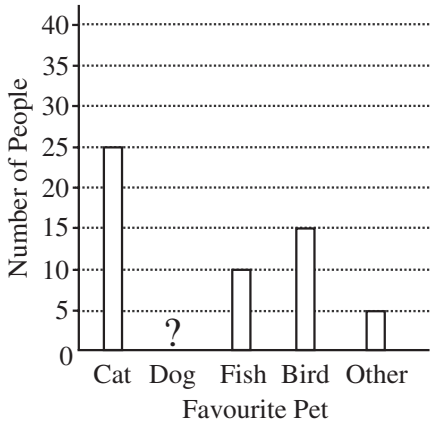
   (**A**) 87 090 (**B**) 807 090 (**C**) 800 790 (**D**) 80 790 (**E**) 87 630

4. $\dfrac{1+2+3}{4+5+6}$ equals

   (**A**) $\frac{1}{9}$ (**B**) $\frac{1}{3}$ (**C**) $\frac{2}{5}$ (**D**) $\frac{4}{11}$ (**E**) $\frac{1}{10}$

5. In a survey, 90 people were asked "What is your favourite pet?" Their responses were recorded and then graphed. In the graph, the bar representing "favourite pet is dog" has been omitted. How many people selected a dog as their favourite pet?

   (**A**) 20 (**B**) 55 (**C**) 40
   (**D**) 45 (**E**) 35



6. Travis spikes his hair using gel. If he uses 4 mL of gel every day, how many days will it take him to empty a 128 mL tube of gel?

   (**A**) 32 (**B**) 33 (**C**) 40 (**D**) 30 (**E**) 28

7. An expression that can be placed in the box to make the equation $\dfrac{3\times 6\times 9}{3} = \dfrac{\square}{2}$ true is

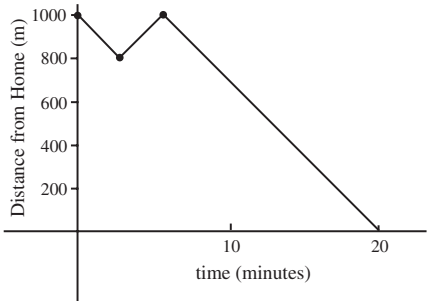
   (**A**) $2\times 4\times 6$ (**B**) $3\times 4\times 6$ (**C**) $2\times 6\times 9$ (**D**) $2\times 4\times 8$ (**E**) $2\times 12\times 18$

8. The words "PUNK CD FOR SALE" are painted on a clear window. How many of the letters in the sign look the same from both sides of the window?

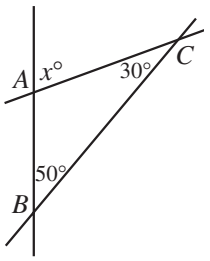
   (**A**) 3 (**B**) 4 (**C**) 5 (**D**) 6 (**E**) 7

9. Spencer was walking home from school when he realized he had forgotten his homework. He walked back to the school, picked up his homework and then walked home. The graph shows his distance from home at different times. In total, how far did he walk?

   (**A**) 2800 m (**B**) 1000 m (**C**) 800 m
   (**D**) 1200 m (**E**) 1400 m



10. In the diagram, three lines meet at the points A, B and C. If $\angle ABC = 50^\circ$ and $\angle ACB = 30^\circ$, the value of x is



(**A**) 80 (**B**) 30 (**C**) 100
(**D**) 60 (**E**) 50

Part B: Each correct answer is worth 6.

11. If $\frac{1}{2}$ of $\frac{2}{3}$ of the twelve small squares in the given figure are removed, how many squares remain?

(**A**) 2 (**B**) 3 (**C**) 4 (**D**) 8 (**E**) 9

12. The perimeter of a rectangular field is 3 times its length. If the perimeter is 240 m, the width of the field is

(**A**) 80 m (**B**) 40 m (**C**) 20 m (**D**) 30 m (**E**) 120 m

13. Chris and Pat go on a 30 km run. They both usually run at 10 km/h. If Chris runs at $\frac{1}{2}$ his usual running speed, and Pat runs at $1\frac{1}{2}$ times her usual speed, how many more hours does it take Chris to complete the run than it takes Pat to complete the run?

(**A**) 1 (**B**) 1.5 (**C**) 2 (**D**) 4 (**E**) 6

14. A box contains 14 disks, each coloured red, blue or green. There are twice as many red disks as green disks, and half as many blue as green. How many disks are green?

(**A**) 2 (**B**) 4 (**C**) 6 (**D**) 8 (**E**) 10

15. A bottle of children's vitamins contains tablets in three different shapes. Among the vitamins, there are 60 squares, 60 triangles and 60 stars. Each shape comes in an equal number of three different flavours – strawberry, grape and orange. A tablet is randomly chosen from a newly opened bottle. What is the probability that this tablet is a grape star?

(**A**) $\frac{1}{9}$ (**B**) $\frac{1}{60}$ (**C**) $\frac{1}{20}$ (**D**) $\frac{1}{3}$ (**E**) $\frac{1}{180}$

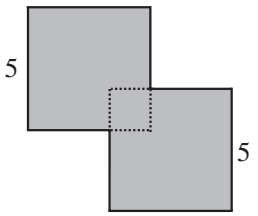
16. Triangle ABC has its vertices at $A(2,0)$, $B(6,0)$ and $C(6,3)$. The area of the triangle, in square units, is

(**A**) 3 (**B**) 4 (**C**) 6 (**D**) 7 (**E**) 12

17. Genna rents a car for a business trip. The rental company charges a fee of \$45 plus 12 cents per kilometre driven. If Genna's bill before taxes is \$74.16, how many kilometres did she travel in the car?

(**A**) 993 (**B**) 375 (**C**) 243 (**D**) 288 (**E**) 618

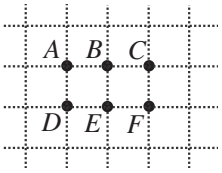
18. Two squares, each with side length 5 cm, overlap as shown. The shape of their overlap is a square, which has an area of 4 cm^2. What is the perimeter, in centimetres, of the shaded figure?



(**A**) 24 (**B**) 32 (**C**) 40
(**D**) 42 (**E**) 50

19. Abraham's mathematics exam had 30 algebra questions and 50 geometry questions, each worth 1 mark. He got 70% of the algebra questions correct, and his overall exam mark was 80%. How many geometry questions did he answer correctly?
(**A**) 43 (**B**) 45 (**C**) 39 (**D**) 41 (**E**) 35

20. Six points A, B, C, D, E, and F are placed on a square grid, as shown. How many triangles that are *not* right-angled can be drawn by using 3 of these 6 points as vertices?



(**A**) 2 (**B**) 1 (**C**) 6
(**D**) 0 (**E**) 4

Part C: Each correct answer is worth 8.

21. In a large hospital with several operating rooms, ten people are each waiting for a 45 minute operation. The first operation starts at 8:00 a.m., the second at 8:15 a.m., and each of the other operations starts at 15 minute intervals thereafter. When does the last operation end?
(**A**) 10:15 a.m. (**B**) 10:30 a.m. (**C**) 10:45 a.m. (**D**) 11:00 a.m. (**E**) 11:15 a.m.

22. Luke has played 20 games and has a 95% winning percentage. Without losing any more games, how many more games in a row must he win to reach exactly a 96% winning percentage?
(**A**) 1 (**B**) 3 (**C**) 4 (**D**) 5 (**E**) 10

23. A different letter is painted on each face of a cube. This cube is shown below in 3 different positions:

What letter belongs on the shaded face of this cube in the following diagram?

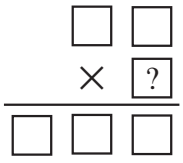
(**A**) T (**B**) P (**C**) X
(**D**) E (**E**) V

24. In the pattern of numbers shown, every row begins with a 1 and ends with a 2. Each of the numbers, not on the end of a row, is the sum of the two numbers located immediately above and to the right, and immediately above and to the left. For example, in the fourth row the 9 is the sum of the 4 and the 5 in the third row. If this pattern continues, the sum of all of the numbers in the thirteenth row is

1 2
1 3 2
1 4 5 2
1 5 9 7 2
⋰ ⋮ ⋱

(**A**) 12 270 (**B**) 12 276 (**C**) 12 282
(**D**) 12 288 (**E**) 12 294

25. The digits 1, 2, 3, 4, 5, and 6 are each placed in one of the boxes so that the resulting product is correct. If each of the six digits is used exactly once, the digit represented by "?" is



(**A**) 2 (**B**) 3 (**C**) 4
(**D**) 5 (**E**) 6