UNIVERSITY OF NEW BRUNSWICK

UNIVERSITÉ DE MONCTON

32nd NEW BRUNSWICK MATHEMATICS COMPETITION

Friday, May 9, 2014

GRADE 7

INSTRUCTIONS TO THE STUDENT:

1. Do not start the examination until you are told to do so.

2. You are permitted to use rough paper. No other aids are necessary.

3. This is a multiple choice test. Each question is followed by five answers marked A, B, C, D, E. Only one is correct. When you have decided on your choice, mark the appropriate letter on your answer sheet using the pencil provided.

4. Problems are worth 3 points each in part A , 4 points each in part B, and 5 points each in part C. The penalty for incorrect answers is one quarter of the points assigned for that question. No penalty is assessed for answers which are left blank.

5. Diagrams are NOT drawn to scale. They are intended as aids only.

6. You have 60 minutes to answer the questions.

7. The use of calculators in the examination room is not allowed.

Grade 7

Part A

1. What is the value of $\frac{1}{2} + \frac{1}{3}$?

(A) $\frac{2}{5}$ (B) $\frac{5}{12}$ (C) $\frac{2}{3}$ (D) $\frac{3}{4}$ (E) $\frac{5}{6}$

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2. Which number represents one hundred million?

(A) 100 000 (B) 1 000 000 (C) 10 000 000 (D) 100 000 000 (E) 100 000 000 000

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3. Which of the following has the greatest value?

(A) 10 x 10 (B) 9 x 11 (C) 8 x 12 (D) 7 x 13 (E) 6 x 14

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4. Which of these numbers is a prime number?

(A) 15 (B) 23 (C) 27 (D) 33 (E) 49

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5. Which of the following lists of decimals are arranged from smallest to largest?

(A) 0.9, 0.85, 0.778, 0.0004 (B) 0.0004, 0.9, 0.85, 0.778 (C) 0.0004, 0.778, 0.85, 0.9
(D) 0.0004, 0.9, 0.778, 0.85 (E) 0.0004, 0.778, 0.9, 0.85

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6. Which of these numbers is the average of the other four numbers?

(A) 5 (B) 7 (C) 8 (D) 9 (E) 16

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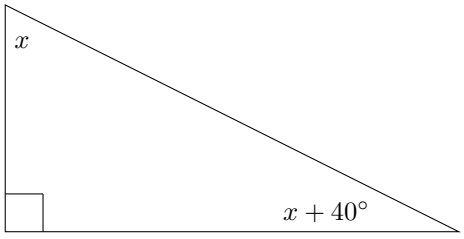
7. For the triangle shown, what is the value of x?



(A) 70° (B) 50° (C) 48° (D) 25° (E) 5°

8. What is the value of $(6+4)(6+4) - (6 \text{ x } 6 + 4 \text{ x } 4)$?

(A) -96 (B) 0 (C) 12 (D) 48 (E) 80

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9. The area of a square is 25 square metres. What is the perimeter of the square?

(A) 10 metres (B) 20 metres (C) 40 metres (D) 80 metres (E) 100 metres

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10. The number 4 is a perfect square since 4 = 2 x 2. What is the smallest positive integer M for which 90 x M is a perfect square?

(A) 1 (B) 2 (C) 4 (D) 10 (E) 100

Part B

11. How many centimetres are equal to 36 metres?

(A) 0.36 (B) 3.6 (C) 360 (D) 3 600 (E) 36 000

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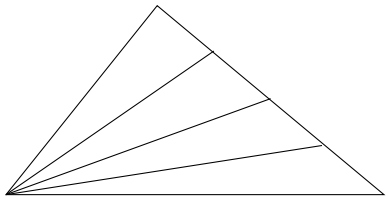
12. How many triangles are in this figure?



(A) 5 (B) 6 (C) 7 (D) 8 (E) 10

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13. If $b = 2c$ and $a = 3b$, what is the value of $\frac{a+b+c}{c}$?

(A) 9 (B) 8 (C) 7 (D) 6 (E) 5

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14. Paul makes his own salmon flies. It takes twice as long to make a "Marabou Comet" as it does to make a "Glo Bug Egg". Paul made 5 "Marabou Comets" and 5 "Glo Bug Eggs" in 1 hour. How many minutes does it take Paul to make a "Marabou Comet"?

(A) 5.5 (B) 8 (C) 12.5 (D) 25 (E) 50

15. Two fair coins are tossed. What is the probability that they both land on "heads"?

(A) $\frac{1}{8}$ (B) $\frac{1}{4}$ (C) $\frac{1}{2}$ (D) $\frac{2}{3}$ (E) $\frac{3}{4}$

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16. In the game of Martian Ball, scores are made in two ways: Kick and Throw. A Kick is worth three times as much as a Throw. Which of the following scores can not be worth the same as 12 Kicks and 7 Throws?

(A) 1 Kick 40 Throws (B) 3 Kicks 34 throws (C) 6 Kicks 24 Throws
(D) 13 Kicks 4 Throws (E) Not enough information

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17. The number 123456789 is multiplied by 1001. What is the sum of the digits in the result?

(A) 45 (B) 54 (C) 63 (D) 72 (E) 90

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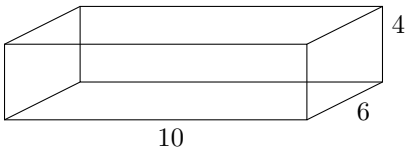
18. How many square units is the total surface area of the rectangular prism shown?



(A) 180 (B) 200 (C) 240 (D) 248 (E) 256

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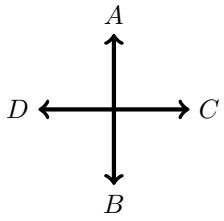
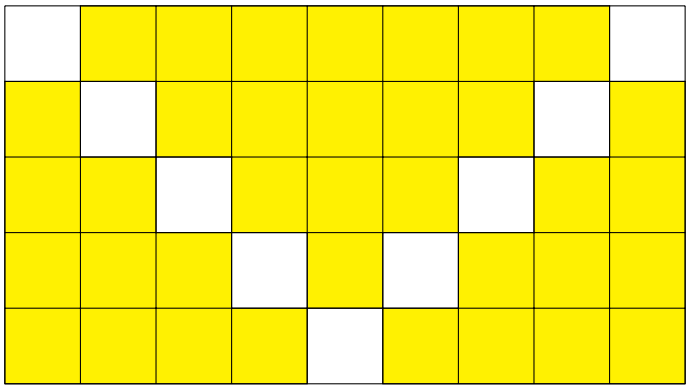
19. Suppose that A, B, C, D represent steps of equal length in each of the directions indicated. If $3A1D2B2C$ denotes three steps in the A direction, followed by one step in the D direction, followed by two steps in the B direction and then two steps in the C direction, then the sequence ends at the same place as



(A) $2A1B3D2C$ (B) $3B3C2A2D$ (C) $1A2D3C$ (D) $2B1A1D$ (E) $3C4A2D$

20. A grid made up of small squares is drawn, as shown. What percent (to the nearest whole number) of the grid is shaded?



(A) 70 (B) 75 (C) 78 (D) 80 (E) 85

Part C

21. Two school volleyball teams each have 10 players. Following the game every player on one team shakes hands with every player on the other team. How many handshakes will there be?

(A) 50 (B) 90 (C) 100 (D) 180 (E) 200

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22. The digits from 1 to 6 are rearranged into two 3 digit numbers where each digit is used exactly once. The resulting two numbers are then added. The largest total that can be obtained is

(A) 579 (B) 975 (C) 1083 (D) 1173 (E) 1332

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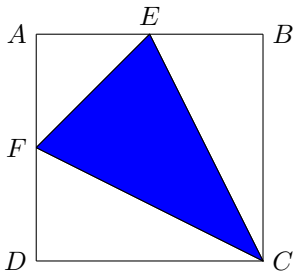
23. One fine day, David and Ruth plant 88 blueberry bushes on their farm. For the first hour, they work together and plant 42 bushes. For the next two hours, Ruth works alone at the same pace and finishes planting the bushes. How many bushes did David plant?

(A) 15 (B) 17 (C) 19 (D) 21 (E) 23

24. The points E and F are joined to C to form a triangle (as shown) inside of a square $ABCD$. If $AE = EB$ and $AF = FD$, and the area of square $ABCD$ is 16 cm^2, what is the area of triangle CEF?



(A) 6 cm^2 (B) 8 cm^2 (C) 9 cm^2 (D) 10 cm^2 (E) $10\frac{2}{3}$ cm^2

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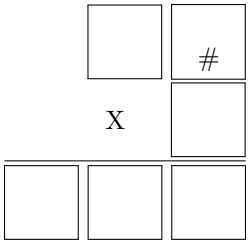
25. The digits 1, 2, 3, 4, 5 and 6 must each be placed in one of the boxes to make the product correct. What is the value of the digit represented by "#" in the product?



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

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26. The counting numbers are written as a long string of digits 123456789101112131415161718192021.... What will be the 2014$^{\text{th}}$ digit of this string?

(A) 0 (B) 2 (C) 5 (D) 7 (E) 8