PIMS Elementary Grades Math Competition   NAME: _____
8 May 2010
Sprint Round - Grade Five Division   SCHOOL: _____
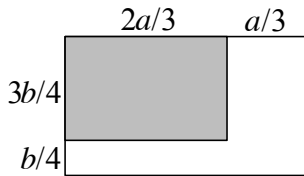
1.   How many metres are in 1.6 km?   _____(m) 1

2.   Round $1.23 + 4.56 + 7.89$ to the nearest whole number.   _____ 2

3.   The large rectangle in the figure below has sides a and b.
What fraction of the large rectangle is shaded?

                                             _____ 3

4.   Simplify to a common fraction: $\dfrac{1+\dfrac{3}{7}}{6+\dfrac{3+5}{7}}$ _____ 4

5.   In 2012, February will have 29 days. It will have 5 Wednesdays.
On what day of the week is February 14, 2012?   _____ 5

6.   Ann took 8 tests (marks are out of 100). Her average on the
first 7 tests was 56. Ann's average on the 8 tests was 60.
What was Ann's mark on the 8th test?   _____ 6

7.   Many of the 204 Canadian athletes who participated in the Winter
Olympics won medals. In total, 4 Canadians won four medals each,
6 won three medals each, 16 won two medals each, and 91 won
one medal each. The rest did not win any medal.
How many Canadian athletes did not win any medal?   _____ 7

8.   Let $N = 9^{2010}$. What is the remainder if you divide N by 10?   _____ 8

9.   The three lines in the figure intersect at a single point. The angles
between pairs of lines are shown. What is the value (in degrees) of x?
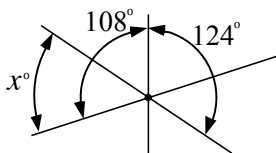
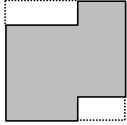   _____(°) 9

Grade Five (5) Division

10.   Dan bought a new calculator at 15% off the regular price, and paid $16.15. What was the regular price (in dollars)?   _____($) 10

11.   What is the sum of all the prime factors of 2010?   _____ 11

12.   From a square with side 5, rectangles are cut out at two corners as shown. Find the perimeter of the shaded region.

_____ 12

13.   The 5-digit whole number N has the decimal representation $a679b$, where a and b are digits. N is divisible by 72. What is the value of N?   _____ 13

14.   Nick sawed off all vertices of a wooden cube (see figure). How many edges does the new solid have?
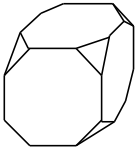
_____ 14

15.   The sum of 6 consecutive positive whole numbers is 189. What is the value of the largest of these numbers?   _____ 15

16. N is the product of three different prime numbers. How many positive factors does N have? Note that 1 and N are factors of N.   _____ 16

17.   Joe walks 4 metres in 3 seconds, and Jill walks 15 metres in 8 seconds. What is the ratio of Joe's speed to Jill's speed? Express your answer as a common fraction.   _____ 17

18.   Three circles of radius 6 are inscribed in a rectangle as in the figure below. Point P is a corner of the rectangle, and points Q and R are points of tangency. Find the area of triangle QPR.
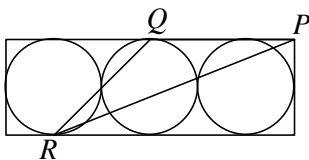
_____ 18

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19. The outer square of the left figure has sides 5. Each of the four shaded right-angled triangles has legs 1 and 4. The shaded triangles are placed at the corners of the rectangle on the right. What is the area of the inner (unshaded) rhombus on the right?
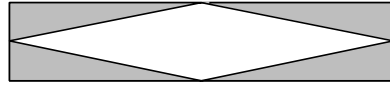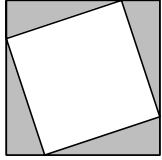
_____ 19

20. A perfect square is a number like $0 = 0^2$, $1 = 1^2$, $4 = 2^2$, $9 = 3^2$, or $16 = 4^2$. Find the value of the smallest perfect square larger than 2010.

_____ 20

21. Two athletes, A and B, competed in the 3000 metre speed skating race at the Richmond Olympic Oval. When A finished, B was still 144 metres from the finish line. If A finished the entire race in 288 seconds, what was the average speed of B (in metres per minute) over these 288 seconds?

_____(m/min) 21

22. How many 3-digit whole numbers have digit sum equal to 10?

_____ 22

23. The line segments represent one-way streets. One can only travel in the direction of the arrows. How many paths are there from A to B?
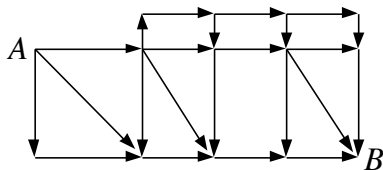
_____ 23

24. Define $x \nabla y = x(y+1)$. What is the value of $(1\nabla 2)\nabla(2\nabla 1)$?

_____ 24

25. The right triangle ABC is isosceles, where $AB = AC = k$, and k is an integer. The shaded region is bounded by two sides of the triangle and by an arc of a circle with radius k and centre at C. The area of the shaded region, when rounded to the nearest whole number is 13. Find the value of k. (Hint: Find an expression for the shaded area in terms of k.)
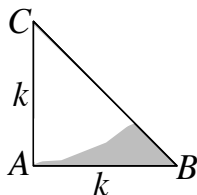
_____ 25

26. You roll two dice, and are told that one or both of the dice shows a 1. Given this information, what is the probability that the sum of the two numbers you rolled is 3? (Hint: Find how many ways there are to roll so that one or both dice shows a 1.)

_____ 26