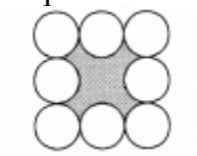
PIMS Elementary Grades Math Competition NAME: _____
02 May 2015
Target Round - Grade Seven Division SCHOOL: _____

1. Alan, Bert and Cody went for a hike in Cypress Bowl. Alan and Bert made some sandwiches each, to be equally shared by all three of them. Alan's cost was $15 and Bert's cost was $9. Cody paid back to Alan and Bert so that the net cost for each one of the three of them is the same. What was the ratio of the amount of money that Cody paid to Bert to the amount of money that he paid to Alan? Express your answer as a common fraction in lowest terms. _____ 1

2. The area of each of the circles is $\frac{16}{\pi}$. Each circle is tangent to two others and the lines connecting their centres form a square. What is the perimeter of the shaded region?



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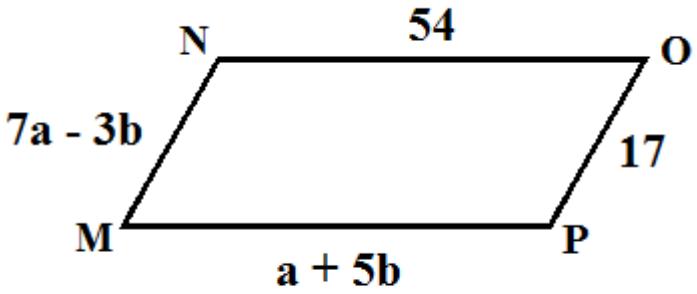
3. The figure below is a parallelogram. What is the value of $3a - b$?



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4. The sum of all the factors of N is 24. What is the smallest possible value of N? Please note that 1 and N are factors of N. _____ 4

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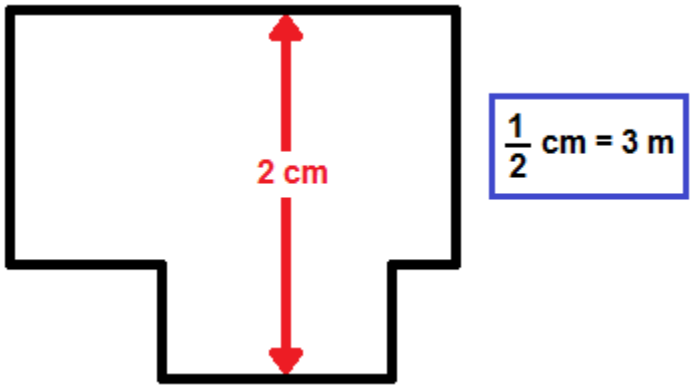
5. Diana has a collection of beads of four different colours. Half of her collection plus one is white. Half of the remainder plus one is black. Half of the remainder plus one is red, and one bead is blue. How many beads does she have? _____ 5

6. A fence encloses a portion of a square yard by eliminating $24m^2$ of the yard as in the sketch below. On the sketch, the side of the square is $2cm$ long. The sketch is drawn to scale so that $\frac{1}{2}cm$ represents $3m$ of the fence.

What portion of the square yard was eliminated?
Express your answer as a common fraction in lowest terms.



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7. Suppose that $p < q < r$ are all primes such that $10q = N < 100$ and $100 > pr > N$.
Find the largest possible value for r ? _____ 7

8. Wilma can get from Point A to point B by either jogging the entire distance or by jogging a third of the distance, walking a third of the distance, and then riding a bike at five times the jogging speed. In both options it takes Wilma the same amount of time to get from point A to point B.
What is the ratio of the walking speed to the jogging speed?
Express your answer as a common fraction in lowest terms. _____ 8

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9. The entry cost per person to the fair went up this year (compared to last year) by 30%. But, the total sales this year (in dollars) went down by 9%. By what percent did the attendance go down this year? _____ (%) 9

10. What is the value of $P + Q$ in the multiplication below?

$$\begin{array}{r} 3\ 9\ P \\ \times\ Q\ 3 \\ \hline \\ \hline 3\ 2\ 9\ 5\ 1 \end{array}$$

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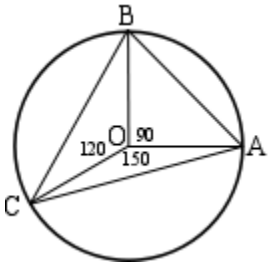
11. Joel walked a certain distance at rate of $8\frac{km}{h}$. If he had walked the same distance at a rate of $7.5\frac{km}{h}$ it would have taken him 2 minutes more. What distance did he walk (in km)? _____(km) 11

12. Points A, B, and C are on a circle with centre at O and radius 1, dividing the circle into 3 wedges of 90, 120, and 150 degrees as in the figure below. What is the area of triangle ΔBOC? Express your answer as $\frac{\sqrt{N}}{M}$ where N is a prime number and M is a whole number.



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