PIMS Elementary Grades Math Competition NAME: _____
8 May 2010
Target Round - Grade Six Division SCHOOL: _____

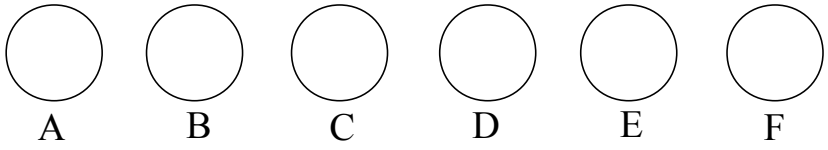
1. Twenty-one people went to the County Fair, some in the stagecoach and the rest in buggies. Later, the same stagecoach and buggies brought them back. On the way to the Fair, 9 people rode in the stagecoach, and 3 people rode in each buggy.
How many people rode in the stagecoach on the return trip, if 4 people rode in each buggy?

_____ 1

2. A bucket was originally full of water. Every minute, 0.2 litres of water dripped out through a hole at the bottom.
After 36 minutes, the bucket was only two-fifths full.
How many litres of water were in the bucket when it was full?

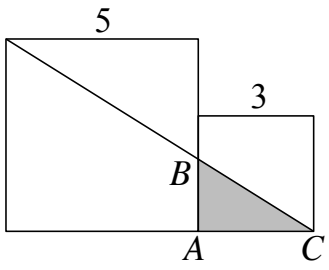
_____(litres) 2

3. Six bowls are arranged in a row. Initially, there are 23 beans in Bowl A (on the left), 8 in B, 4 in C, 17 in D, 32 in E, and 6 in F. You want to move beans until there is an equal number of beans in each bowl. You are allowed to move a bean from any bowl to any other bowl. What is the minimum number of beans that have to be moved *in the left to right* direction?



_____ 3

4. In the picture below, the larger square has side 5, and the smaller square has side 3.
What is the area of triangle *ABC* ?
Express your answer as a common fraction.
(Hint: Some triangles are similar.)



_____ 4

Grade Six (6) Division

5. On a safety device, red and green signal lights are flashing.
The red light flashes every 1 minute 20 seconds, and the green light flashes every 0.3 minutes.
At 1:00 PM both lights flashed simultaneously.
What is the time interval (in seconds) between consecutive simultaneous red and green flashes?

_____(sec) 5

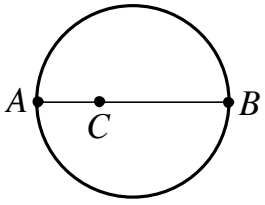
6. An equilateral triangle, a square, a regular pentagon, and a regular hexagon all have integer sides and all have the same perimeter.
What is the smallest possible size of a side of the triangle?

_____ 6

7. There are 5 beads in a jar: 2 are white, and 3 are black.
Jana picks 2 of the beads at random.
What is the probability that the 2 beads are of the same colour?
Express your answer as a common fraction.

_____ 7

8. A and B are the endpoints of a diameter of a circular pond, and C is a point on this diameter. It takes Andrew exactly as long to swim from C to A (along the diameter) as it takes for Joshua to run around the edge of the pool from B to A. It takes Andrew twice as long to swim from C to B (along the diameter) as it takes for Joshua to run around the edge of the pool from B to A.
Given that Andrew swims at $\frac{6}{\pi}$ km/hour, at what speed (in km/hour) does Joshua run?
(Hint: Find the location of C on AB.)



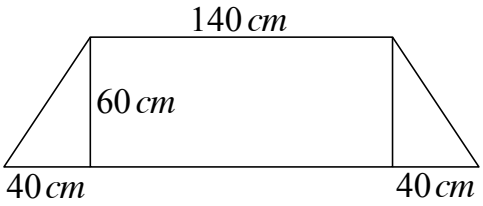
_____(km/h) 8

Grade Six (6) Division

9. Augustus writes a 5-letter word using the characters A, B, C, D, and E in a certain order from left to right.
The letter A is to the left of C but to the right of D.
The letter B is to the right of D but to the left of A.
The letter E is to the right of B but to the left of C.
If E is not the third letter of the word, which letter is third?

_____ 9

10. A carpenter designed desks for the lab of Tech Elementary.
The dimensions of each desktop are as shown.
What is the total desktop surface area (in cm^2) of 30 such desks?

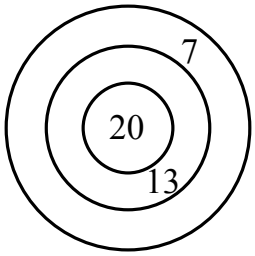


_____(cm^2)10

11. Suppose that $2010 = a + a^2 + a^3 + \cdots + a^n$,
where a and n are positive whole numbers.
What is the value of $a + n$?

_____ 11

12. A circular dart board (the outer circle) has two additional circles drawn on it as shown. If a dart lands in a region, you get the number of points shown. Note that you get 1 point if the dart lands outside the dart board.
In a game, Bully's score was 200, Avergy's score was 50, and Missy's score was 19. They each threw the *same* number of darts.
What is the smallest possible value of that number of darts that each of them threw?
(Hint: Most possibilities can be easily ruled out.)



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