

# 2012 IWYMIC Answers

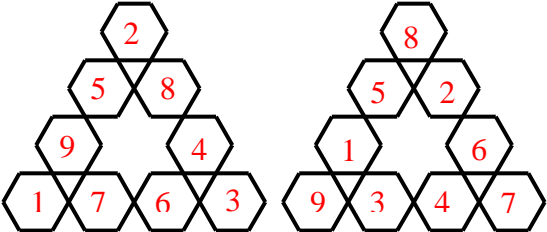
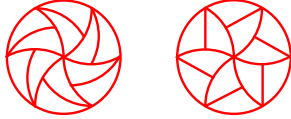
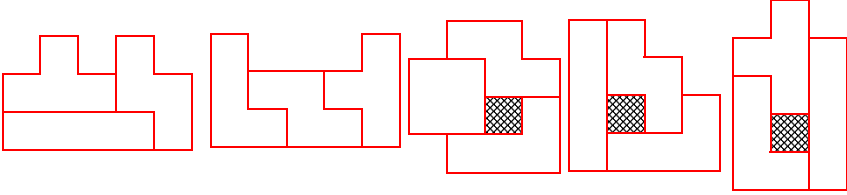
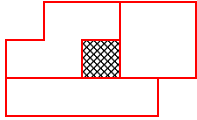
## Individual Part I

1.	678	2.	$\frac{3\sqrt{3}}{2}$	3.	7161, 9361, 9812	4.	4	5.	1458	6.	672
7.	672	8.	6	9.	160	10.	536	11.	$\frac{2}{3}$	12.	196

## Individual Part II

1.	2012	2.	54	3.	20°
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## Team

1.	$\frac{3}{8}, \frac{9}{8}, \frac{27}{8}, 3, 6$ and 9	2.	53		
3.	<p>The minimum sum is 17 and the maximum sum is 23</p> 	4.	4026		
5.	1006, 1051, 1501, 2003, 2102, 3002 and 6001	6.	20	7.	
8.	<p>Label the balls 1 to 7. In the first weighing, put balls 1 and 2 in the first box, balls 3 and 4 in the second box and balls 5, 6 and 7 into the third box. The red light of the third box cannot go on. There are three cases.</p> <p><b>Case I.</b> No red lights go on. Then one of ball 5, 6 and 7 is heavy. In the second weighing, put ball 5 in the first box, ball 6 in the second box and put two of the other five balls in the third box. Again, the red light of the third box cannot go on. If no red lights go on, then ball 7 is heavy. If the red light of the first box goes on, then ball 6 is heavy. If the red light on the second box goes on, then ball 5 is heavy.</p> <p><b>Case II.</b> The red light of the first box goes on. Then one of balls 3 and 4 is heavy. In the second weighing, put ball 3 in the first box, ball 4 in the second box and put two of the other five balls in the third box. The red light of either the first box or the second box must go on, and the heavy ball can be found.</p> <p><b>Case III.</b> The red light of the second box goes on. This is analogous to Case II, with one of balls 1 and 2 being heavy.</p>				
9. (a)				9. (b)	
10.	0, 9				