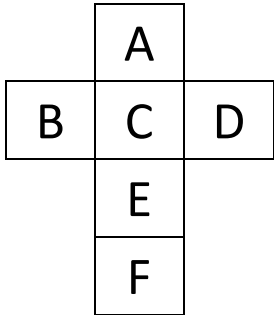
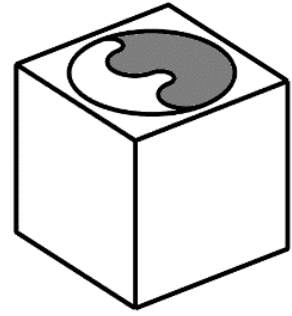
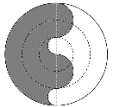
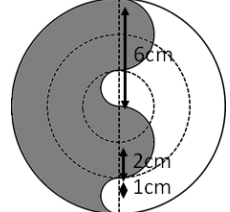
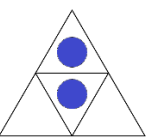
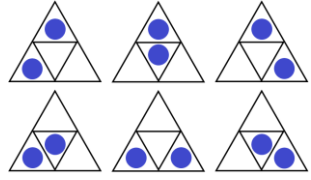
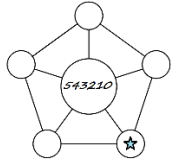
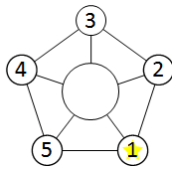
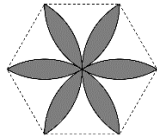


Problem Solving Competition Answer Sheet



A cube is designed so that each face contains a symbol based on a mathematical problem or puzzle. Each symbol must be placed on the correct face of the cube. Solve the puzzles and problems and then use the clues to find out which symbol goes where. One symbol is already in place to help you.

		Value	Position																		
1		<p>Use $\frac{\pi r^2}{2}$ to find the area of a semi circle</p> $\frac{\pi 6^2}{2} + 2 \frac{\pi 2^2}{2} - 2 \frac{\pi 1^2}{2} = \frac{\pi 36}{2} + 2 \frac{\pi 4}{2} - 2 \frac{\pi}{2}$ $= 18\pi + 4\pi - \pi = 21\pi$ <p>$n = 21$</p>		C																	
2	$\frac{2^{2^{2^2}}}{4^3}$	$\frac{2^{2^{2^2}}}{4^3} = \frac{2^{2^4}}{4^3} = \frac{2^{16}}{4^3} = \frac{65536}{64} = 1024 = 2^{10}$ <p>$x = 10$</p>	F																		
3		 <p>Number of ways = 6</p>	D																		
4	<table border="1" style="border-collapse: collapse; text-align: center;"><tr><td>☆</td><td>25</td><td>15</td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td>35</td><td></td></tr></table>	☆	25	15					35		<p>Top left number = 50</p> <table border="1" style="border-collapse: collapse; text-align: center;"><tr><td>50</td><td>25</td><td>15</td></tr><tr><td>-5</td><td>30</td><td>65</td></tr><tr><td>45</td><td>35</td><td>10</td></tr></table>	50	25	15	-5	30	65	45	35	10	E
☆	25	15																			
	35																				
50	25	15																			
-5	30	65																			
45	35	10																			
5		$n_1 = \frac{543210}{5} - 2, n_2 = \frac{543210}{5} - 1, n_3 = \frac{543210}{5},$ $n_4 = \frac{543210}{5} + 1, n_5 = \frac{543210}{5} + 2$ <p>Topmost number = $n_3 = 108642$</p>		B																	
6		<p>Arc length = $\frac{2\pi r\theta}{360} = \frac{2\pi 6(60)}{360} = 2\pi$</p> <p>12 arcs in total, total perimeter = $12(2\pi) = 24\pi$</p> <p>$m = 24$</p>	A																		