

G1 (1 point possible)

For the 6 faces and 8 vertices of a regular hexahedron, respectively sealed with red and blue these 2 beads (each face contains a bead and each vertex contains a bead), how many different types of solutions are there?


**Answer:** 776**EXPLANATION**

No movement  $(1)^{14}$  one situation

Made the center of the opposite faces as shaft, rotate  $\pm \frac{\pi}{2}$ ,  $(1)^2(4)^3$  six situation

Made the center of the opposite faces as shaft, rotate  $\pi$ ,  $(1)^2(2)^6$  three situation

Made the center of the opposite edges as shaft, rotate  $\pi$ ,  $(2)^7$  six situation

Made the opposite vertexes as shaft, rotate  $\frac{2\pi}{3}$ ,  $(1)^2(3)^4$  eight situations

totally:

$$\frac{1}{24} [2^{14} + 6 \times 2^5 + 3 \times 2^8 + 6 \times 2^7 + 8 \times 2^6] = 776$$

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G2 (1/1 point)

10 red, 10 blue, 10 green matches are used to build a regular icosahedron, how many possible solutions are there?

- ☐  $l = \frac{(30!) * 2^{30} + 24 * (6!) * 2^6}{60}$   
☐  $l = \frac{30!}{10!10!10!} * 2^{30} + 24 * \frac{6!}{2!2!2!} * 2^6$   
☒  $l = \frac{\frac{30!}{10!10!10!} * 2^{30} + 24 * \frac{6!}{2!2!2!} * 2^6}{60}$  ✓

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