Warm-Up: The Gallery

Prepared by Mark on January 25, 2025

A museum curator is arranging seven photographs on a gallery wall in accordance with the photographer's requirements. They are titled as follows: Fence, Gardenias, Hibiscus, Irises, Katydid, Lotus, and Magnolia.

The photograph's requirements are as follows:
- Gardenias must be immediately before Katydid.
- Hibiscus must be somewhere before Katydid but cannot be the first photograph.
- Irises and Lotus must be next to one another.
- Magnolia must be one of the first three photographs.
- Fence must be either first or seventh.

Problem 1:

Which of the below could be a valid ordering?

Note: We denote each painting by the first letter of its title.

- `FHGMKIL`
- `HMGKILF`
- `ILMHGKF`
- `LMIHGKF`
- `MFHGKLI`

Problem 2:

If Irises is immediately before Gardenias, which of the following could be true?
- Gardenias is fourth
- Hibiscus is fourth
- Irises is third
- Lotus is second
- Magnolia is third

Problem 3:

The ordering of the photographs is fully determined if...
- Gardenias is fourth
- Hibiscus is second
- Irises is second
- Lotus is first
- Magnolia is third

Problem 4:
If Magnolia is second, what CANNOT be true?
- Hibiscus is third
- Hibiscus is fourth
- Hibiscus is fifth
- Gardenias is fourth
- Gardenias is sixth

Problem 5:
Katydid cannot be in which position?
- Third
- Fourth
- Fifth
- Sixth
- Seventh

Problem 6:
If Gardenias is fourth, what must be true?
- Fence is first
- Hibiscus is third
- Irises is seventh
- Magnolia is first
- Magnolia is second

Problem 7:
Which one of the following, if substituted for the second condition, would have the same effect in determining the arrangement of the photographs?
- If Fence is seventh, Hibiscus is second
- Gardenias is somewhere after Hibiscus, and either Fence or Magnolia is first
- Hibiscus must be somewhere between the first and sixth photographs
- Unless Hibiscus is second, it must be somewhere between Magnolia and Gardenias
- Katydid is somewhere after Hibiscus, which must be after Fence.