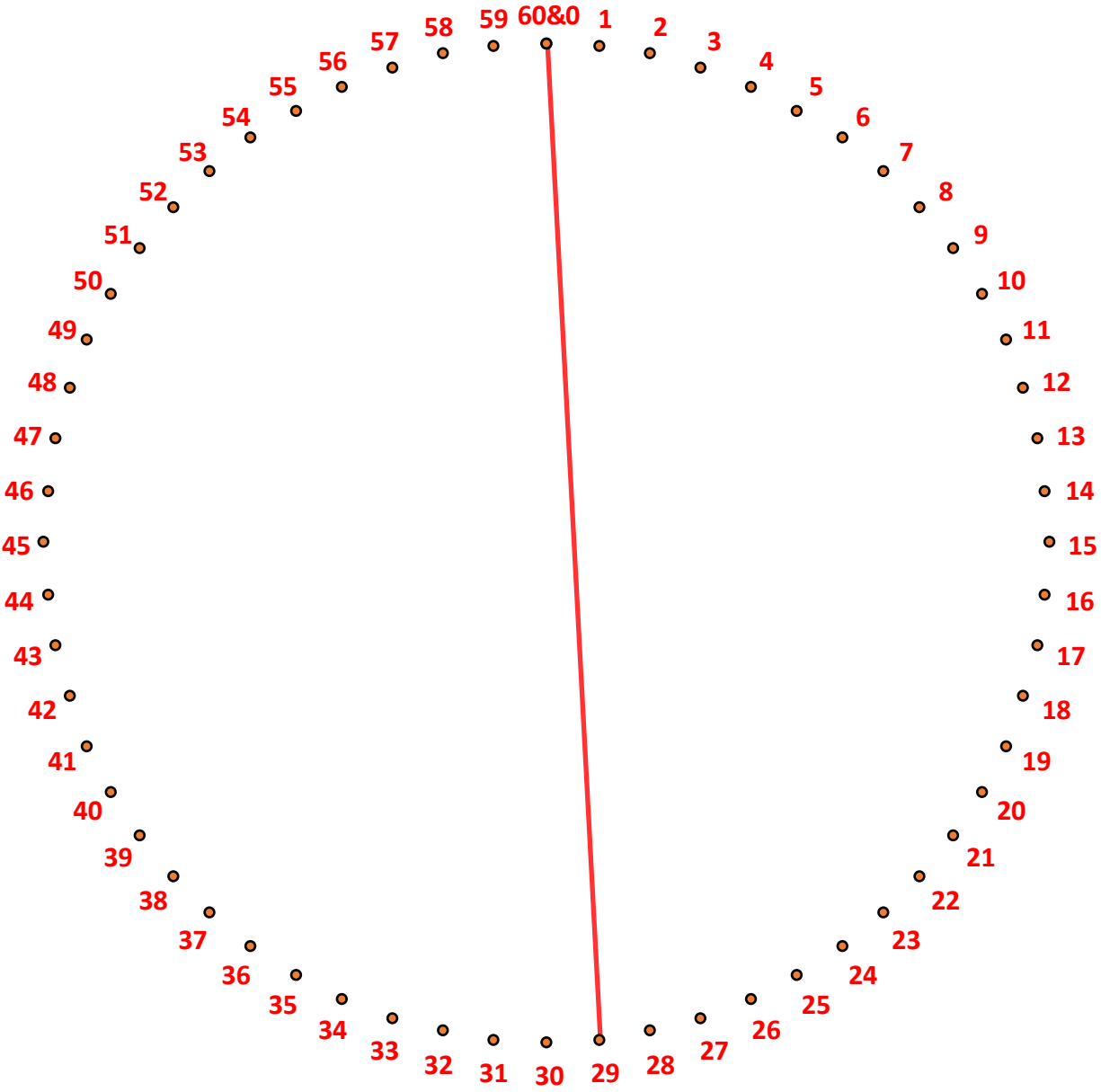


# Creating Internal 12,4 and 12,3-Stars Challenge Questions

Assumes you have read section 1.6.



**Each of the questions is based on a 60,29-star, the first line of which is shown.**

1. Suppose you wanted to see a different 6,2-star from the one examined in explainer [1.6c](#). The first line you want to use is line 5 from vertex **56** to **25**.
  - a. What line numbers are used in this instance? (You need not provide vertex to vertex line placements but instead, focus your attention on the pattern that must develop to get the appropriate lines drawn.)
  - b. Describe your answer in modular terms.
2. The internal 6,2-star discussed in explainer 1.6c used equilateral triangles.
  - a. How could you add to this to create an internal 12,4-star?
  - b. How many lines are required?
  - c. What line numbers are used in this instance? (You need not provide vertex to vertex line placements but instead, focus your attention on the pattern that must develop to get the appropriate lines drawn.)
  - d. Describe your answer in modular terms.
3. Suppose you wanted to create an internal 30,10-star that includes line 1 from vertex **0** to **29** as part of the image.
  - a. How many lines are required?
  - b. What lines would you need to use in this instance? (You need not provide vertex to vertex line placements but instead, focus your attention on the pattern that must develop to get the appropriate lines drawn.)
  - c. Describe your answer in modular terms.
  - d. Would this star include both the **blue** and **red** portions of the 6,2-star used in the explainer?
4. Suppose you wanted to create an internal 15,5-star that includes line 1 from vertex **0** to **29** as part of the image.
  - a. How many lines are required?
  - b. What lines would you need to use in this instance? (You need not provide vertex to vertex line placements but instead, focus your attention on the pattern that must develop to get the appropriate lines drawn.)
  - c. Describe your answer in modular terms.
  - d. Would this star include both the **blue** and **red** portions of the 6,2-star in explainer 1.6c?
5. An internal 12,3 star was discussed in the [Analyzing Stars inside a Star](#) explainer. Use the image above, together with pencil and ruler to create an internal 12,3-star that includes the first line of the 60,29-star shown. The rest of the lines are suppressed but can be obtained using the *Excel* file (or the web version).
  - a. Is this star also created from equilateral triangles?
  - b. How many lines are required?
  - c. What line numbers are used in this instance? (You need not provide vertex to vertex line placements but instead, focus your attention on the pattern that must develop to get the appropriate lines drawn.)
  - d. Describe your answer in modular terms.
6. This is only if you have done both problems 2.c and 5.c.
  - a. Explain why you got the same answer to both questions.
  - b. Are there any other internal 12-stars possible using these lines?