

Polar Coordinates on Your Face

Using the polar coordinate system, evaluate the symmetry of your face and explain in a technical analysis.

Detailed Description

Each student receives a photograph of his/her face taken looking directly into the camera with no expression. Using the center of the tip of the nose as point 0, the student develops a graph on the photograph to complete the following steps:

1. Find the polar coordinates for several key points of the face (inside and outside of both eyes and eyebrows, outside of both nostrils, corners of the mouth, top and bottom tips of both ears) and draw on the photograph the points and lines used to determine polar coordinates.
2. Find Cartesian coordinates for the same points.
3. Make a table listing coordinates of points in both polar and Cartesian systems.
4. Write technical analysis explaining process used and an evaluation of the symmetry of the face.

Students graded on: photograph with lines and points, table of coordinates, technical analysis

Time to complete: 1 week

Specific Grading Criteria

- Correctly applied polar and Cartesian coordinate systems on photo and in analysis.
- Points correctly derived in both systems.
- Plotting and drawing on face were correct, neat, and easy to understand.
- Correctly applied and formed/spelled all math symbols/terms.
- Evaluation of symmetry was logical and justified.

General Grading Criteria

- Followed directions (on time, as assigned).
- Correct mechanics (spelling, punctuation, capitalization).
- Sentences and word choice correct.
- Sentences complete.
- Organized (logical and clear) and easy to follow.
- Complete (included all details).
- Work neatly done.

Productivity Skills

- Stays focused on completing responsibilities.
- Completes tasks on time and to expectations.

Main Standard Assessed

Analysis

Standard 5: Be able to apply trigonometry to find solutions.

Performance Indicators

A. Be able to apply the polar coordinate system.

Difficulty: .5

District Code: _____

Other Standard Assessed

Analysis

Standard 2: Be able to apply math analysis knowledge and skills to a variety of purposes.

Performance Indicators

D. Possess technical skills: read/write/present technical analysis.

Difficulty: .5

District Code: _____

Polar Coordinates on Your Face

Name: _____ Date: _____

Specific Grading Criteria	12	9	6	3	0
• Correctly applied polar and Cartesian coordinate systems on photo and in analysis.					
• Points correctly derived in both systems.					
• Plotting and drawing on face were correct, neat, and easy to understand.					
• Correctly applied and formed/spelled all math symbols/terms.					
• Evaluation of symmetry was logical and justified.					

General Grading Criteria	4	3	2	1	0
• Followed directions (on time, as assigned).					
• Correct mechanics (spelling, punctuation, capitalization).					
• Sentences and word choice correct.					
• Sentences complete.					
• Organized (logical and clear) and easy to follow.					
• Complete (included all details).					
• Work neatly done.					

Productivity Skills	Yes	No
• Stays focused on completing responsibilities.		
• Completes tasks on time and to expectations.		

"Goes Beyond" Criteria	12	9	6	3	0
Creativity, extra effort, depth, higher thinking, understanding (Specify)					

Total Points					
