

Quarter 2 Summarizing Project

Topic List:

- 1) Inductive reasoning, and deductive reasoning - What is, and the difference between the two types of reasonings.
- 2) Proofs - What is proof?
- 3) Congruent Triangles (1) - How to identify congruent Triangles, and congruent Triangles shortcuts
- 4) Congruent Triangles (2) - Proofing congruent triangles and their corresponding parts
- 5) Similar Triangles; similar triangles vs. Congruent triangles
- 6) Pythagorean Theorem, and Special Right Triangles
- 7) Distance formula and relation to Pythagorean Theorem
- 8) Trigonometry - Defining Trigonometry, and simple applications
- 9) Trigonometry (2) - Trigonometry and the Unit Circle

1) Inductive reasoning, and deductive reasoning

What is inductive reasoning?

What is deductive reasoning?

What is the differences between inductive reasoning versus deductive reasoning?

Provide 2 examples of inductive reasoning (1 with numbers, and 1with shapes)

Provide 2 examples of deductive reasoning (1 with numbers and 1 with shapes)

How are inductive reasoning and deductive reasoning the fundamental skills for Geometric proofs?

Completely answer each of the questions above on a google doc, include a hard copy for Mr. Lee on the day of your group's presentation.

Complete a visual presentation using the criteria above (Posters, google slides etc...)

2) Proofs - What is proof?

What is the purpose of proofs?

What is the role of proofs in Geometry?

What are the important details that must be made explicit in proofs?

Provide an example of proofs in algebra.

Provide an example of a proof in geometry.

How does proofs relate to congruent triangles, similar triangles, and the Pythagorean Theorem?

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3) Congruent Triangles (1) - How to identify congruent Triangles, and congruent Triangles shortcuts

What does congruent mean?

What are the vital information is needed to determine if 2 (or more) triangles are congruent?

What are the 6 shortcuts to determine if 2(or more) triangles are congruent (make a table, diagram and short description of each shortcut)?

Include a copy of the shortcuts as a visual.

What is the purpose of knowing 2(or more) congruent triangles?

What are the differences between congruent triangles and similar triangles?

How does congruent triangles relate to proofing congruent triangles?

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4) Congruent Triangles (2) - Proofing congruent triangles and their corresponding parts

What does congruent mean?

What are the vital information is needed to determine if 2 (or more) triangles are congruent?

What is CPCTC?

How does CPCTC assist in determining if 2 (or more) triangles are congruent or not?

Describe how one can determine if 2 (or more) triangles are congruent or each other.

Provide 3 different example proofs of triangles (1 that results in congruent triangles, 1 results in not congruent or similar triangles, and 1 resulting in similar triangles).

In detail, what are the differences between congruent triangles and similar triangles?

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5) Similar Triangles; similar triangles vs. Congruent triangles

What are similar triangles?

What algebraic concepts plays a role in determining if 2 (or more) triangles are similar?

Describe briefly how this algebraic concept assist in determining similar triangles. Provide 2 examples of this algebraic concept.

What are shortcuts (conjectures) in determining if 2(or more) triangles are similar to each other? Define each conjecture and provide a visual example.

Provide 2 example proofs to determine if the the given triangles are similar or not (1 that result in similar triangle, and 1 not resulting in similar triangles).

In detail, what are the differences between congruent triangles and similar triangles?

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6) Pythagorean Theorem, and Special Right Triangles

What is the equation for the Pythagorean Theorem?

Construct an example of a triangle that can be described using the Pythagorean Theorem.

Define the Pythagorean Triples in your own words?

Give 2 example of Pythagorean Triples.

What is the relationship between the Pythagorean Theorem and 45-45-90 Right Triangle?

Construct 2 examples of this relationship (one example with numbers, and the other with variable representations).

What is the relationship between the Pythagorean Theorem and 30-60-90 Right Triangle?

Construct 2 examples of this relationship (one example with numbers, and the other with variable representations).

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7) Distance formula and relation to Pythagorean Theorem

What is the Distance formula on 2-D coordinate plane?

What is the Distance formula on 3-D coordinate plane?

What is the relationship between the Pythagorean Theorem and the Distance Formula?

Create a diagram on graph paper to demonstrate this relationship. Use coordinates on the graph as needed.

Create a word problem that uses, not necessarily as the final step, the distance formula.

Provide a valid process and solution to your group's creation.

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8) Trigonometry (1) - Defining Trigonometry, and simple calculations/ applications

What is the relationship between triangles and trigonometry?

Construct a right triangle. Label $\triangle ABC$, with length C as the hypotenuse, meaning $\angle acb$ is a right angle.

Label $\angle abc$ with measure θ .

Define sine, cosine and tangent as a description of the lengths of the triangle. What mnemonic device maybe a tool to assist you in remembering each definition?

Define sine, cosine, and tangent with respect to the constructed triangle.

When given ALL the lengths of the triangle, how can one solve for $\angle\theta$ with respect to
a) sine, b) cosine, and c) tangent.

Construct 6 examples triangles, along with the steps, in which one is to calculate (**do not use** angle measures for special right triangles):

- a) The length of a side of a triangle using the sine function.
- b) The length of a side of a triangle using the cosine function.
- c) The length of a side of a triangle using the tangent function.
- d) The angle θ between 2 sides of a triangle using the sine function.
- e) The angle θ between 2 sides of a triangle using the cosine function.
- f) The angle θ between 2 sides of a triangle using the tangent function.

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9) Trigonometry (2) - Trigonometry and the Unit Circle

Construct a **Precise** Unit Circle (yes, the angle measurement has to be 30 degrees for example).

Label the constructed Unit Circle with the "special" coordinates.

How do the "special" coordinates relate to special right triangles?

How does the "special" coordinates relate to sine and cosine?

Create a table of values for sine, cosine, and tangent using the "special" coordinates.

Describe the how to calculate tangent using the table.

Construct 6 examples triangles, along with the steps, in which one is to calculate (use **only** angle measures for special right triangles):

- a) The length of a side of a triangle using the sine function.
- b) The length of a side of a triangle using the cosine function.
- c) The length of a side of a triangle using the tangent function.
- d) The angle θ between 2 sides of a triangle using the sine function.
- e) The angle θ between 2 sides of a triangle using the cosine function.
- f) The angle θ between 2 sides of a triangle using the tangent function.

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