**Curriculum Sample Template**
Max.8Pages

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|---|---|---|---|
| **Grade Level** | 10 | **Content Area** | Mathematics |
| **Course Title** (grades9-12Only) | Geometry | | |
| **Expected Prior Knowledge**<br>*The knowledge/skills mastered earlier in the year foundational to the mastery of the required Standard in the current sample.* | Students are expected to have a mastery understanding of similarity and proving theorems using similarity. Students are also expected to be able to use congruence and similarity to be able to prove relationships between similar triangles. | | |
| **Alignment to Program of Instruction**<br>*Briefly outline methods of instruction found in this sequence of lessons that align to the Program of Instruction described in A.3.* | As project based learning is a key feature in the school's mission, students will apply knowledge gained in math to complete projects and solve real world issues, and some may even be cross curricular. Lessons are aligned to both the program of instruction and common core standards by scaffolding knowledge, engaging students and requiring them to use higher depths of knowledge to demonstrate mastery and solve real world problems. | | |
| **Standard Number and Description**<br>*List the Number* and full description for the required Standard.* | G.SRT.6<br>Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles. | | |
| **Materials/Resources Needed** | All required class worksheets and tests, tape measurer. | | |

****StandardNumber**:ForEnglishLanguageArts(ReadingandWriting),useGrade,Strand,Standard(e.g.,3.RI.2).ForK-8Math,useGrade,Domain,Standard(e.g.,6.EE.7).ForHSMath,useConceptualCategory-Domain,Standard(e.g.,A-REI.6).ForScience,useGrade,Strand,Concept,PO(e.g.,4.1.3.1).*

| **Lesson** (add as needed | **Instruction** | **Student Activities** |
|---|---|---|
| **1** | **Objective: SWBAT Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.**<br>Teacher introduces the standard and vocabulary of sine, cosine, and tangents and instructs students to take notes in their math notebooks. Teacher gives students a practice worksheet with practice problems. Teacher facilitates students completing the worksheet, and then allows them time to review their answers with a partner, correcting each others' work as needed. | Students will learn and take notes on the topic of using similarity to understand that side ratios in right triangles are properties of the angles of the triangle, leading to definitions of trigonometric ratios for acute angles. Students will take notes on instruction and follow along with practice problems on the board by taking notes in their math notebooks. Students then complete an independent practice worksheet. After completion of the worksheet, students will then have the opportunity to compare answers to a partners, and correct any incorrect work. |
| **2** | **Objective: SWBAT Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.**<br>Teacher instructs students to brainstorm as many real world applications as possible in 3 minutes, and then writes them on the board. As practice, the class is told they will solve one of these real world applications by working with a partner and measuring the height of a tree/building, structure of any kind. Teacher will give students instructions on how to find the heights using similarities and trigonometric ratios. Students will then complete summative assessment 1, in which the Teacher will instruct the students to complete an extended writing piece, explaining how someone can find different measurements of different items using similarity and trigonometric ratios. | Students will brainstorm as many real world applications as they can think of in exactly 3 minutes. They will then participate in sharing their real world examples as the teacher writes them on the board. Students will write examples of real world applications in their notes. Students will then pair up and find the measurement of the height of a tree or building. Students will measure with a tape measurer the length of a shadow and use a compass to find the angle of the sun. Students will then calculate the height of the structure. If time permits, students can do a second calculation while the rest of the class is finishing their own calculations. Students return to the classroom and complete the first summative assessment which is an extended writing piece explaining how someone can find different measurements of different items using the properties of similarity and trigonometric ratios. |

| | | |
|---|---|---|
| **3** | **Objective: SWBAT Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.**<br>Teacher will assign students their second summative assessment project, which is to create their own investigations into finding a variable using similarity and trigonometric ratios. Teacher assigns students to find the variable of any 5 student designed problems, for example, finding the height of their house using the same technique practiced at school. Teacher instructs students to clearly write out the procedure and complete the math problem designed by the student. Students may begin writing problems out during class time and will finish as an out of class project. | Students begin their second summative assessment, in which they will design and investigate 5 problems finding a variable using the strategy in the objective. Students must identify the variable they wish to solve, for example, the height of a tree in their back yard, and will write out step by step the procedure of how to find the height using the procedure practiced at school, and will then solve for the height, showing all math work. |
| **4** | **Objective: SWBAT Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.**<br>Teacher will distribute written summative assessment for students to complete during the class period. | Students will complete a formal written summative assessment during the entire class period. |

***Paste Summative Assessment Here:***

***1. Real World Applications Extended Writing***

Explain in complete sentences the process of how to find an unknown angle using sine, cosine, or tangent. This should be a step by step complete set of instructions that answers any possible questions a reader may have.

| Category | Level 4: Achieves Standards at a High Level | Level 3: Performance at Standard | Level 2: Performance below Standard | Level 1: Demonstrates Minimal Success |
|---|---|---|---|---|
| Mathematical Concepts | Explanation shows complete understanding of the mathematical concepts used to solve the problem(s). 25 points. | Explanation shows substantial understanding of the mathematical concepts used to solve the problem(s). 20 points | Explanation shows some understanding of the mathematical concepts needed to solve the problem(s). 15 points | Explanation shows very limited understanding of the underlying concepts needed to solve the problem(s) OR is not written. 10 points |
| Explanation | Explanation is detailed and clear. 25 points | Explanation is clear. 20 points | Explanation is a little difficult to understand, but includes critical components. 15 points | Explanation is difficult to understand and is missing several components OR was not included. 10 points |
| Strategy/ Procedures | Uses an efficient and effective strategy to solve the problem(s). 25 points | Uses an effective strategy to solve the problem(s). 20 points | Sometimes uses an effective strategy to solve problems, but does not do it consistently. 15 points | Rarely uses an effective strategy to solve problems. 10 points |
| Mathematical Terminology and Notation | Correct terminology and notation are always used, making it easy to understand what was done. 25 points | Correct terminology and notation are usually used, making it fairly easy to understand what was done. 20 points | Correct terminology and notation are used, but it is sometimes not easy to understand what was done. 15 points | There is little use, or a lot of inappropriate use, of terminology and notation. 10 points |

***2. Real World Applications Project***

Directions: Design 5 applications to finding an unknown angle or length using sine, cosine, or tangent. Solve for the unknown variable, explaining what measurements they used, the purpose, and how they were able to calculate the unknown variable.

| Category | Level 4:<br>Achieves Standards at a High Level | Level 3:<br>Performance at Standard | Level 2:<br>Performance below Standard | Level 1:<br>Demonstrates Minimal Success |
|---|---|---|---|---|
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### *3. Comprehensive Written Assessment*

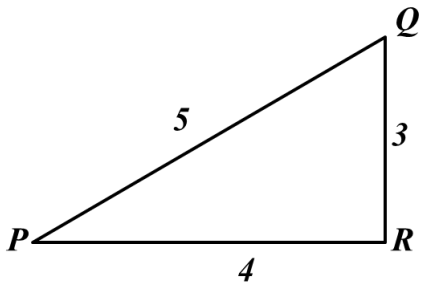
1.Given a 3, 4, 5 right triangle what is the tangent of IQ.

a. 1.3

b. 0.8

c. 0.6

d. 1.0



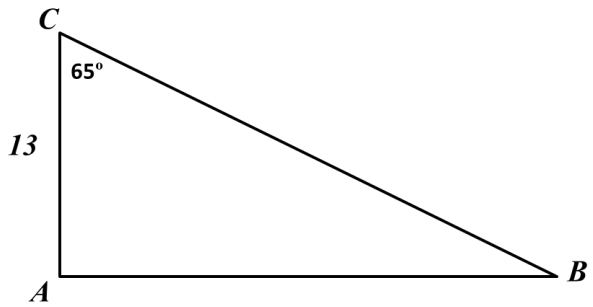

2.The cosine for IC (65º) = 0.422. If $\overline{AC} = 13$, find the approximate length of BC.

a. 3.1

b. 6.0

c. 14.4

d. 30.7



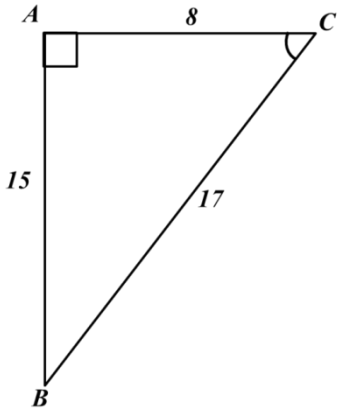

3.Find the tangent of IC.

a. 2.12

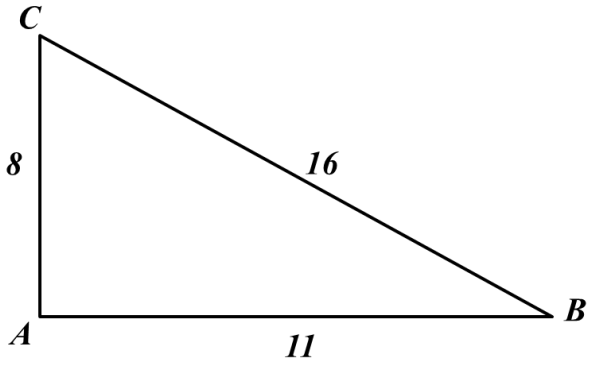
b. 1.87

c. 0.53

d. 0.47



4. Find the sin of angle B.




4. A ladder rests against a wall. The top of the ladder reaches 15 feet up the wall and makes a 53º angle with the wall. How long is the ladder?

Answer: _____

Answer Key
1. A
2. D
3. B
4. Sine B = ½ or 0.5
5. Ladder is 24.9 feet