Good Day Gentlemen,

hope you and your families are safe and continue to experience good health. 😊

there are two pdf file at the bottom of this: one is the student-version, (smaller size 686.5kB) with questions and the other is the teacher-version (bigger file876.5kB) with the same questions and answers. use the teacher version (on the right) to help answer the questions in the student-version on the left: use both files. to avoid getting the file mixed up, the teacher-version can be identify by the green circle with a "T", in the upper-right-hand corner of each page; however, the student-version does not have the green circle with a T.

materials: for this lesson: calculators with trigonometry buttons and the calculator's users manual.

introduction:
trigonometry: before opening the teacher's version attached to this email, take a minute and on your calculator find the *sin* button. for example find the *sin* of 30 degrees: *sin*(30)? the answer is 0.5 and the *cos*(30) = 0.866... rounding off to three decimal places.

discussion:
open the attached file on the right, the teacher's version. skip the opening material and go to page 405 and read the discussion (6 minutes) and finish the reading on page 406 but only read the first two short paragraphs: stop reading after the short paragraph for *cos*(theta). we are not using the tangent, the *tan*(theta) is not for this lesson.

assignment:
open the student-version file attached below on the left. on pages s.161 and s.162, (the page number is located in the lower right-hand side of the page), there are 6 exercises.

format: when you submit your answers, so that i can grade your work, you will need to identify each exercise using the page number from of student-version and then identify the exercise number: for example, when you open this lesson, the first page number is located in the ***lower*** right-hand side of the page. for this lesson, it is page number s.161 and there are five exercises: 1-5 on this page. thus, you will submit your answers, use the following **format**:

page number and exercise number

s.161 exercise 1: then type your answer
s.161 exercise 2: _ your answer___
s.161 exercise : 3_ your answer___ and so on, etc.

after completing these 6 exercises on pages s.161 and s.162, you will need your calculator to find the missing Angle Measures in the table labeled Group 1.on page s.162. exercise 1.

how to find the missing angle in a right triangle? use the inverse button on your calculator.

i. first, we are going to determine how to find the angles in a right triangle. since we know one of the three angles is 90 degrees, because in a right triangle one of the angle is *always* 90 degrees. we only need one more angle? why, because the sum of all three angles in any triangle is always 180 degrees.

ii. to find the angle measure needed in the blank column 2 of the table Group 1, on page S.162 labeled "Angle Measures" for exercise 1, you need to use the ***inverse*** button on your calculator. it is normally labeled the **INV** button but some calculators have the **arc** button for the inverse**!** you will have to consult your calculator's manuals to learn how to use the inverse button since each calculator is different: it is real very simple once you learn how. 😓 before🤔. and after 🤗

iii. thus to find the one of the remaining two angles in a right triangle, see column 2 of the Group 1 on page s.162 we use the opp/hyp ratio given in column 4 of this table ***or*** the adj/hyp ratio in column 5. it does not matter which ratio you use!

iv.remember, that that the ratio of opposite side to the hypotenuse (opp/hyp) is the sine or *sin* and the ratio of the adjacent side over the hypotenuse (adj/hyp) is the cosine or *cos* buttons on your calculators. we use this information to find one of the two acute angles in any right triangle.

v. using your calculator, take the inverse of the sine or *inv* sin(12/13) = 67 degrees round off to the nearest whole degree. this is the answer for exercise 1,l column 2 in table Group 1 on page s.162.

or you can use the inverse of the cosine or *inv*cos(5/13) = 67 degrees rounding off. this gives you the same answer for exercise 1, column 2 in table Group 1 on page s.162.

note: that the fraction bar means to press the division button on your calculator as follows: hit the inverse button for sin on your calculator and enter the ratio of 12/13. the " / " means to hit the division button. so the *inv*sin(12 divided 13) equal 67 degrees. also some calculators use the *arc*sin(12/13) instead of *inv*sin(12/13) they mean the same thing.

how to find the length measures in column 3 exercise 1, Group 1 on page s.162?

i. to find the Length Measures, use either the *sin* ratio and the cosine, *cos,* ratio to determine the lengths of the triangles.

ii. how do we do this? remember, that the *sin* is the ratio of the length of a right triangle's opposite side to the length of the hypotenuse side, thus using columns 4 and column 5 you are given all three sides and can finish exercise 1 with find the length measures of all three sides of the triangle. and now start on exercise 2 of the table group 1 page s.162.

iii. but before you start to complete the table group 1 exercise 2 on page s.162, you should draw a right triangle. this is a very **important step** to do before you start any of the exercises.

important step:

how to draw the proper right triangle: orientation is important: orientation means the way you *draw* and l*abe*l your right triangle: *counter-clockwise.*

i. on page s.162 look at the right triangle drawn for exercise six. this is the preferred *orientation,* the way to draw the right triangle. orientation means the way you *draw* and l*abe*l your right triangle.

ii. does it matter which angle we use to determine the opposite side and the adjacent side? no! it does not matter which angle you use to determine the opposite side or the adjacent side. in exercise 6 page s.162 the triangle using angle K to identify the opposite side and the adjacent side, you can use angle J as the angle to identify the opposite side or the adjacent side, it simple does not matter which acute angle you use.

iii. notice when we want to label the triangle in exercise 6, we label it as triangle JLK starting at J and going in a *counter-clockwise* direction to L and continue in a counter-clockwise direction to K and back to J; thus we would call this triangle, triangle JLK labeling it in a *counter-clockwise* orientation. use this counter-wise direction in this lesson to draw and label all your right triangles.

Scoring rubric:how you are to be graded for this assignment.

65-74% completing all exercises 1-6 on pages s.161 and s.162, and group 1 and group 2

i. 65% completing all exercises 1-6 on pages s.161 and s.162, and group 1 and group 2 completing at least group 1 exercises 1 and 2.

ii. 70% group 1 exercise 2: write a short paragraph explaining why the ratio of opp/hyp is 4/5?

iii. 74% group 2 exercise 3: write a short paragraph explaining how you got the hypotenuse equal to

a value of 12, round off?

75-84% for completing the scoring rubric for 65%-74% plus
i. doing exercise 7 page s.164. ***you show your work*** (algebra and arithmetic) to receive full credit: find value for x and value for y?

85-89% for completing the above rubric for 75%-84% plus
i. exercise 8 page s.164. ***you show your work*** (algebra and arithmetic) to receive full credit: find value for x and value for z?

90-94% for completing the above rubric for 85%-89% plus
i. exercise 9 page s.164.
you show your work (algebra and arithmetic) to receive full credit: find values for x and value for z?

95-100% for completing the above rubric for 90%-94% plus
i. exercise 10 page s.164
you show your work (algebra and arithmetic) to receive full credit: find values for y?