Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Mathematics	178	MTH 178 09/26/2023-General Trigonometry
College	Division	Department
Math, Science and Engineering Tech	Math, Science and Engineering Tech	Math & Engineering Studies
Faculty Preparer		Hanan Wahab
Date of Last Filed Assessment Report		10/28/2021

I. Review previous assessment reports submitted for this course and provide the following information.

1. Was this course previously assessed and if so, when?

   Yes

   Through Winter 2021.

2. Briefly describe the results of previous assessment report(s).

   Students met the standard of success for all outcomes.

3. Briefly describe the Action Plan/Intended Changes from the previous report(s), when and how changes were implemented.

   All instructors were encouraged to focus on problem areas from the last assessment, including providing more practice problems.

II. Assessment Results per Student Learning Outcome

Outcome 1: Solve triangles.

- Assessment Plan
  - Assessment Tool: Outcome-related exam questions
  - Assessment Date: Winter 2023
  - Course section(s)/other population: All sections
  - Number students to be assessed: All students or a random sample with a maximum of 40 students

- How the assessment will be scored: Departmental rubric
- Standard of success to be used for this assessment: 70% of the students will score 75% or better.
- Who will score and analyze the data: Lead instructor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2023	2023	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
36	34

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Based on the assessment plan, a random sample of students was assessed. The number of students enrolled and assessed differ due to student withdrawal, dropping the course or not completing the assessment tool.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Two sections of this course are taught face-to-face, and one section taught virtually. Common final exams were collected from all MTH 178 instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were scored using a rubric. The scores on the rubric ranged from 0 - 4. The description of the rubric is included in spreadsheet that is attached to the MTH 178 Final item analysis.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
Test questions used to assess this outcome were # 1, 2, 13, 14, 15 and 16. The percentages of students that received a 3 or 4 on the rubric were 94% (32/34), 88%

(30/34), 91% (31/34), 85% (29/34), 91% (31/34) and 88% (30/34) respectively. This meets the standard of success that 70% of the students will score a 75% or higher.

The section involves solving triangles of different configurations.
Most of our students can solve these types of problems.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The majority of our students were able to solve problems involving triangles. Students demonstrated a deep understanding of the problems including an ability to identify the appropriate mathematical concept and achieve the correct response.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Regardless of the scores of our students, we will continue to provide support for them. The results indicate that the students did their best in this outcome. We do not need to make any changes.

Outcome 2: Interpret trigonometric graphs and graph trigonometric functions.

- Assessment Plan
    - Assessment Tool: Outcome-related exam questions
    - Assessment Date: Winter 2023
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students or a random sample with a maximum of 40 students
    - How the assessment will be scored: Departmental rubric
    - Standard of success to be used for this assessment: 70% of the students will score 75% or better.
    - Who will score and analyze the data: Lead instructor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2023	2023	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
36	34

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample of students was assessed based on the assessment plan. The number of students enrolled and assessed differ due to student withdrawal, dropping the course or not completing the assessment tool

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Two sections of this course are taught face-to-face, and one section taught virtually. Common final exams were collected from all MTH 178 instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were scored using a rubric. The scores on the rubric ranged from 0 - 4. The description of the rubric is included in spreadsheet that is attached to the MTH 178 Final item analysis.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

Test question #7 was used to assess this outcome. 94% of students (32/34) scored a 3 or 4 on the rubric. This meets the standard of success that 70% of the students will score a 75% or higher.

Our students were successful in graphing this type of function.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students were asked to graph a sine trigonometric function. Our students were successful in graphing this type of a function and identifying the important parts of

the graph including the translation of the sine wave. Most students seem to be confident in their ability to graph this type of function. They checked their graph using a graphing calculator.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

We will continue to offer support and more practice to the students on the final review in graphing the sine wave and identifying the important parts of the graph, such as identifying the five key points on the graph, the x-intercepts, the maximum and the minimum of the sine wave.

Outcome 3: Prove trigonometric identities.

- Assessment Plan
    - Assessment Tool: Outcome-related exam questions
    - Assessment Date: Winter 2023
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students or a random sample with a maximum of 40 students
    - How the assessment will be scored: Departmental rubric
    - Standard of success to be used for this assessment: 70% of the students will score 75% or better.
    - Who will score and analyze the data: Lead instructor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2023	2023	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
36	34

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample of students was assessed based on the assessment plan. The number of students enrolled and assessed differ due to student withdrawal, dropping the course or not completing the assessment tool.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Two sections of this course are taught face-to-face and one section taught virtually. Common final exams were collected from all MTH 178 instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were scored using a rubric. The scores on the rubric ranged from 0 - 4. The description of the rubric is included in spreadsheet that is attached to the MTH 178 Final item analysis.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

Test questions used to assess this outcome were #8 and 9. The percentages of students who score a 3 or 4 on the rubric were 88% (30/34) and 88% (30/34) respectively.
This meets the standard of success that 70% of the students will score a 75% or higher. Students have a good grasp on proving identities.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students were asked to prove trigonometric functions. The majority of our students were able to prove identities successfully.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

For the final review, we will continue to offer more practice to the students in this area to enhance their ability in proving identities. This practice will include using trigonometric identities to rewrite trigonometric equations that model real-life situations.

Outcome 4: Solve trigonometric equations.

- Assessment Plan
    - Assessment Tool: Outcome-related exam questions
    - Assessment Date: Winter 2023
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students or a random sample with a maximum of 40 students
    - How the assessment will be scored: Departmental rubric
    - Standard of success to be used for this assessment: 70% of the students will score 75% or better.
    - Who will score and analyze the data: Lead instructor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2023	2023	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
36	34

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample of students was assessed based on the assessment plan. The number of students enrolled and assessed differ due to student withdrawal, dropping the course or not completing the assessment tool

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Two sections of this course are taught face-to-face, and one section taught virtually. Common final exams were collected from all MTH 178 instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were scored using a rubric. The scores on the rubric ranged from 0 - 4. The description of the rubric is included in spreadsheet that is attached to the MTH 178 Final item analysis.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

Test questions used to assess this outcome were #10, 11 and 12. The percentages of students who scored a 3 or 4 on the rubric were 82% (28/34), 79% (27/34) and 88% (30/34) respectively. This meets the standard of success that 70% of the students will score a 75% or higher.

The topic of solving trigonometric equations is somewhat difficult. However, the students demonstrated their strength in solving equations.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students were asked to solve trigonometric equations. The majority of our students were able to solve equations fairly well.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Some students had difficulty solving equations that contain more than one type of trigonometric functions. Some had difficulties performing algebraic techniques on an equation.

Our plan is to give them support and more practice on the algebraic techniques of solving quadratic equations in form. These important concepts will continue to be stressed in both lectures and during the final review.

Outcome 5: Solve problems involving radian measure.

- Assessment Plan
    - Assessment Tool: Outcome-related exam questions
    - Assessment Date: Winter 2023
    - Course section(s)/other population: All sections

- Number students to be assessed: All students or a random sample with a maximum of 40 students
- How the assessment will be scored: Departmental rubric
- Standard of success to be used for this assessment: 70% of the students will score 75% or better.
- Who will score and analyze the data: Lead instructor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2023	2023	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
36	34

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

Two sections of this course are taught face-to-face and one section taught virtually. Common final exams were collected from all MTH 178 instructors. The number of students enrolled and assessed differ due to student withdrawal, dropping the course or not completing the assessment tool.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

Two sections of this course are taught face-to-face and one section taught virtually. Common final exams were collected from all MTH 178 instructors. The number of students enrolled and assessed differ due to student withdrawal, dropping the course or not completing the assessment tool.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were assessed using a rubric. The scores on the rubric ranged from 0 - 4. The description of the rubric is included in spreadsheet that is attached to the MTH 178 Final item analysis.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this

learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
Test questions used to assess this outcome were # 3, 4, 5 and 6. The percentages of students who scored a 3 or 4 on the rubric were 91% (31/34), 94% (32/34), 88% (30/34) and 88% (30/34) respectively. This meets the standard of success that 70% of the students will score a 75% or higher. Students have an excellent grasp on converting degree measure to radian measure, as well as working with problems involving radian measure.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Almost all the students could successfully solve these types of problems. Students were asked to convert degree measure into radian measure and to work with problems involving radian measure. Almost all of the students understood the difference between degree measure and radian measure. Students had an excellent grasp on problems involving radian measure.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Our plan is to give them support and more practice problems for the final review.

III. Course Summary and Intended Changes Based on Assessment Results

1. Based on the previous report's Intended Change(s) identified in Section I above, please discuss how effective the changes were in improving student learning.

In the previous report there were no intended changes.

2. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

The assessment data indicates that we are meeting the needs of students for this course. Outcome 1: Solve triangles: 94% to 88% of students received a score of 3 & 4. Outcome 2: Graphing trigonometric functions: 94% of students received a score of 3 & 4.

Outcome 3: Proving identities: 88% of students received a score of 3 & 4.

Outcome 4: Solving trigonometric equations: 82% to 88% of students received a score of 3 & 4.

Outcome 5: Solving problems involving radian measure: 91% to 88% of students received a score of 3 &4.

Overall the course is helping the students meet the course outcomes very well.

3. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

No major changes intended since we met the needs of our students according to the assessment plan. However, we will continue to give our students support and more practice to strengthen their understanding of some hard topics such as solving trigonometric equations and the techniques of solving quadratic equations in both lectures and during the final review.
We will provide extra practice for reinforcement.

4.

Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Course Materials (e.g. textbooks, handouts, on-line ancillaries)	Continue to provide/add support and practice problems for difficult concepts/type of problems, such as identifying the five key points on the graph such as the x-intercepts, maximum and minimum of the sine wave, proving identities, applying algebraic techniques to solve quadratic equations, and solving equations	Based on the current assessment, these were areas of lower performance or areas where students struggled.	2023

	with more than one type of trigonometric function.		

5. Is there anything that you would like to mention that was not already captured?

None.

III. Attached Files

Sample Data File

Faculty/Preparer:	Hanan Wahab	**Date:** 12/14/2023
Department Chair:	Nichole Klemmer	**Date:** 12/15/2023
Dean:	Tracy Schwab	**Date:** 12/19/2023
Assessment Committee Chair:	Jessica Hale	**Date:** 07/22/2024

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Mathematics	178	MTH 178 07/01/2021-General Trigonometry
College	Division	Department
	Math, Science and Engineering Tech	Math & Engineering Studies
Faculty Preparer		Hanan Wahab
Date of Last Filed Assessment Report		11/01/2017

I. Review previous assessment reports submitted for this course and provide the following information.

1. Was this course previously assessed and if so, when?

   Yes

   Winter/Spring 2019

2. Briefly describe the results of previous assessment report(s).

   Overall, students have been successful in mastering the outcomes for this course.

3. Briefly describe the Action Plan/Intended Changes from the previous report(s), when and how changes were implemented.

   No changes were recommended.

II. Assessment Results per Student Learning Outcome

Outcome 1: Solve triangles.

- Assessment Plan
  - Assessment Tool: Outcome-related questions on the common exam
  - Assessment Date: Winter 2022
  - Course section(s)/other population: All sections
  - Number students to be assessed: All students or a random sample with a maximum of 40 students
  - How the assessment will be scored: Departmental rubric

- Standard of success to be used for this assessment: 70% of the students will score 70% or better.
- Who will score and analyze the data: Lead instructor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2020	2021	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
104	40

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample of students was assessed based on the assessment plan.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All sections of this course are taught face-to-face. Due to covid-19, the classes met virtually. Common final exams were collected from all MTH 178 instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were scored using a rubric. The scores on the rubric ranged from 0 - 4. The description is included in the attached spreadsheet of the MTH 178 Final item analysis.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
Test questions used to assess this outcome were # 1, 2, 13, 14, 15 and 16. The percentages of students that received a 3 or 4 on the rubric were 98%, 98%, 90%, 93%, 90% and 90% respectively. This meets the standard of success that 70% of the students will score a 70% or higher.

The majority of our students are able to solve these types of problems, which involve solving triangles of different configurations.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

The majority of our students were able to solve problems involving triangles. Students demonstrated a deep understanding of the problems including an ability to identify the appropriate mathematical concept and achieve the correct response.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Even though the results indicate that the students did their best in this outcome, we will continue to provide support regard less of their high score. But we do not need to make any changes.

Outcome 2: Interpret trigonometric graphs and graph trigonometric functions.

- Assessment Plan
    - Assessment Tool: Outcome-related questions on the common exam
    - Assessment Date: Winter 2022
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students or a random sample with a maximum of 40 students
    - How the assessment will be scored: Departmental rubric
    - Standard of success to be used for this assessment: 70% of the students will score 70% or better.
    - Who will score and analyze the data: Lead instructor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2020	2021	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
104	40

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample of students was assessed based on the assessment plan.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All sections of this course are taught face-to-face. Due to covid-19, the classes met virtually. Common final exams were collected from all MTH 178 instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were scored using a rubric. The scores on the rubric ranged from 0 - 4. The description is included in the attached spreadsheet of the Mth178 Final Item analysis.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
Test question #7 was used to assess this outcome. 95% of students (38/40) scored a 3 or 4 on the rubric. This meets the standard of success that 70% of the students will score a 70% or higher. Our students were successful in graphing this type of function.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students were asked to graph a sine trigonometric function. Our students were successful in graphing this type of a function and identifying the important parts of the graph including the translation of the sine wave. Most students seem to be confident in their ability to graph this type of function. They checked their graph using a graphing calculator.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Some students had difficulty identifying where the maximum and the minimum of the of the sine wave are located. We will continue to offer support and more practice to the students in this area for the final review.

Outcome 3: Prove trigonometric identities.

- Assessment Plan
    - Assessment Tool: Outcome-related questions on the common exam
    - Assessment Date: Winter 2022
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students or a random sample with a maximum of 40 students
    - How the assessment will be scored: Departmental rubric
    - Standard of success to be used for this assessment: 70% of the students will score 70% or better.
    - Who will score and analyze the data: Lead instructor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2020	2021	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
104	40

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample of students was assessed based on the assessment plan.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All sections of this course are taught face-to-face. Due to covid-19, the classes met virtually. Common final exams were collected from all MTH 178 instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were scored using a rubric. The scores on the rubric ranged from 0 - 4. The description is included in the attached spreadsheet of MTH 178 Final item analysis.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
Test questions used to assess this outcome were #8 and 9. The percentages of students who score a 3 or 4 on the rubric were 98% and 95% respectively. This meets the standard of success that 70% of the students will score a 70% or higher. Students have a good grasp on proving identities.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students were asked to prove trigonometric functions. The majority of our students were able to prove identities successfully.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

We will continue to offer more practice to the students in this area for the final review to enhance their ability in proving identities. This practice will include using trigonometric identities to rewrite trigonometric equations that model real-life situations.

Outcome 4: Solve trigonometric equations.

- Assessment Plan
    - Assessment Tool: Outcome-related questions on the common exam
    - Assessment Date: Winter 2022
    - Course section(s)/other population: All sections

- Number students to be assessed: All students or a random sample with a maximum of 40 students
- How the assessment will be scored: Departmental rubric
- Standard of success to be used for this assessment: 70% of the students will score 70% or better.
- Who will score and analyze the data: Lead instructor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2020	2021	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
104	40

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample of students was assessed based on the assessment plan.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All sections of this course are taught face-to-face. Due to covid-19, the classes met virtually. Common final exams were collected from all MTH 178 instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were scored using a rubric. The scores on the rubric ranged from 0 - 4. The description is included in the attached spreadsheet of MTH 178 Final item analysis.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

Test questions used to assess this outcome were #10, 11 and 12. The percentages of students who scored a 3 or 4 on the rubric were 93%, 85% and 90% respectively. This meets the standard of success that 70% of the students will score a 70% or higher.

The topic of solving trigonometric equations is somewhat difficult. However, the students demonstrate their strength in solving equations.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students were asked to solve trigonometric equations. The majority of our students were able to solve equations fairly well.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Some students had difficulty solving equations that contain more than one type of trigonometric functions. Some had difficulties performing algebraic techniques on an equation.

Our plan is to give them support and more practice on the algebraic techniques of solving quadratic equations in form. These important concepts will continue to be stressed in both lectures and during the final review.

Outcome 5: Solve problems involving radian measure.

- Assessment Plan
    - Assessment Tool: Outcome-related questions on the common exam
    - Assessment Date: Winter 2022
    - Course section(s)/other population: All sections
    - Number students to be assessed: All students or a random sample with a maximum of 40 students
    - How the assessment will be scored: Departmental rubric
    - Standard of success to be used for this assessment: 70% of the students will score 70% or better.
    - Who will score and analyze the data: Lead instructor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
2020	2021	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
104	40

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

A random sample of students was assessed based on the assessment plan.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All sections of this course are taught face-to-face. Due to covid-19, the classes met virtually. Common final exams were collected from all MTH 178 instructors.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were assessed using a rubric. The scores on the rubric ranged from 0 - 4. The description is included in the attached spreadsheet of MTH 178 Final Item analysis.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

Test questions used to assess this outcome were # 3, 4, 5 and 6. The percentages of students who scored a 3 or 4 on the rubric were 98%, 98%, 95% and 95% respectively. This meets the standard of success that 70% of the students will score a 70% or higher.

Students have an excellent grasp on converting degree measure to radian measure, as well as working with problems involving radian measure.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students were asked to convert degree measure into radian measure and to work with problems involving radian measure. Almost all of the students understood the difference between degree measure and radian measure. Students had an excellent grasp on problems involving radian measure. Almost all of the students could successfully solve these types of problems.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Our plan is to give them support and more practice problems for the final review.

III. Course Summary and Intended Changes Based on Assessment Results

1. Based on the previous report's Intended Change(s) identified in Section I above, please discuss how effective the changes were in improving student learning.

In the previous report there were no intended changes.

2. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

The assessment data indicates that we are meeting the needs of students for this course.

Outcome 1: Solve triangles: 90% to 98% of students received a score of 3 & 4.

Outcome 2: Graphing trigonometric functions: 95% of students received a score of 3 & 4.

Outcome 3: Proving identities: 95% to 98% of students received a score of 3 & 4.

Outcome 4: Solving trigonometric equations: 85% to 93% of students received a score of 3 & 4.

Outcome 5: Solving problems involving radian measure: 95% to 98% of students received a score of 3 &4.

Overall the course is helping the students meet the course outcomes very well.

3. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

No major changes intended since we met the needs of our students according to the assessment plan. However, we will continue to give our students support and more practice to strengthen their understanding of some hard topics such as solving trigonometric equations and the techniques of solving quadratic equations in both lectures and during the final review. We will provide extra practice for reinforcement.

4. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Course Materials (e.g. textbooks, handouts, on-line ancillaries)	Continue to provide/add support and practice problems for difficult concepts/type of problems, such as identifying the maximum and minimum of the sine wave, proving identities, applying algebraic techniques to solve quadratic equations and solving equations with more than one type of trigonometric function.	Based on the current assessment, these were areas of lower performance or areas where students struggled	2021
Other: Standard of success	Update the standard of success to read: 70% of students will score 75% or higher.	The updated standard of success aligns with the rubric used for assessment.	2021

5. Is there anything that you would like to mention that was not already captured?

6.

III. Attached Files

F20-W21 MTH 178 Final Analysis

Faculty/Preparer:	Hanan Wahab	**Date:** 07/15/2021
Department Chair:	Lawrence David	**Date:** 07/20/2021
Dean:	Victor Vega	**Date:** 07/22/2021
Assessment Committee Chair:	Shawn Deron	**Date:** 10/28/2021

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Mathematics	178	MTH 178 07/09/2019-General Trigonometry
Division	Department	Faculty Preparer
Math, Science and Engineering Tech	Math & Engineering Studies	Hanan Wahab
Date of Last Filed Assessment Report		

I. Review previous assessment reports submitted for this course and provide the following information.

1. Was this course previously assessed and if so, when?

   Yes

   Winter; Spring/Summer 2017

2. Briefly describe the results of previous assessment report(s).

   Students met the standard of success for the last assessment report.

3. Briefly describe the Action Plan/Intended Changes from the previous report(s), when and how changes were implemented.

   No changed were recommended.

II. Assessment Results per Student Learning Outcome

Outcome 1: Solve triangles.

- Assessment Plan
  - Assessment Tool: Common Exam Questions
  - Assessment Date: Fall 2017
  - Course section(s)/other population: All sections.
  - Number students to be assessed: All students or a random sample with a maximum of 40 students.
  - How the assessment will be scored: Departmental rubric

- Standard of success to be used for this assessment: 70% of the students will score 70% or better.
- Who will score and analyze the data: Course Mentor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
40	27

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

There were two sections of Math 178 in the winter of 2019. Data were collected from both sections. 13 students stopped coming to class.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All sections of this course were taught face-to-face.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were assessed using a rubric. The scores on the rubric ranged from 0 - 4.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
85% of the students a scored a 3 (11%) or 4 (74%) on the rubric. This meets the standard of success that 70% of the students will score a 70% or higher. The majority of our students are able to solve these types of problems which involve solving triangles of different configurations.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students were able to solve problems involving triangles. Students demonstrated a deep understanding of the problems including an ability to identify the appropriate mathematical concept and achieve the correct response.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

We will continue to offer more practice to the students in this area where they need improvement.

Outcome 2: Interpret trigonometric graphs and graph trigonometric functions.

- Assessment Plan
    - Assessment Tool: Common Exam Questions
    - Assessment Date: Fall 2017
    - Course section(s)/other population: All sections.
    - Number students to be assessed: All students or a random sample with a maximum of 40 students.
    - How the assessment will be scored: Departmental rubric
    - Standard of success to be used for this assessment: 70% of the students will score 70% or better.
    - Who will score and analyze the data: Course Mentor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
40	27

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

There were two sections of Math 178 in the winter of 2019. Data were collected from both sections. 13 students stopped coming to class.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All sections of this course were taught face-to-face.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were assessed using a rubric. The scores on the rubric ranged from 0 - 4.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
74% of the students scored a 3 (30%) or 4 (44%) on the rubric. This meets the standard of success that 70% of the students will score a 70% or higher. Our students were successful in graphing this type of function.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students were asked to graph a sine trigonometric function. Our students were successful in graphing this type of a function and identifying the important parts of the graph. Most students seem confident in their ability to graph this type of function.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Some students had difficulty in identifying the length of the period of the sine wave. We will continue to offer more practice to the students in this area for the final review.

Outcome 3: Prove trigonometric identities.

- Assessment Plan
    - Assessment Tool: Common Exam Questions
    - Assessment Date: Fall 2017
    - Course section(s)/other population: All sections.
    - Number students to be assessed: All students or a random sample with a maximum of 40 students.
    - How the assessment will be scored: Departmental rubric
    - Standard of success to be used for this assessment: 70% of the students will score 70% or better.
    - Who will score and analyze the data: Course Mentor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
40	27

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

There were two sections of Math 178 in the winter of 2019. Data were collected from both sections. 13 students stopped coming to class.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All sections of this course were taught face-to-face.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were assessed using a rubric. The scores on the rubric ranged from 0 - 4.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
78% of the students scored a 3 (19%) or 4 (59%) on the rubric. This meets the standard of success that 70% of the students will score a 70% or higher. Students have a good grasp on proving identities.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students were asked to prove trigonometric functions. The majority of our students were able to prove identities successfully.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

We will continue to offer more practice to the students in this area for the final review to enhance their ability in proving identities.

Outcome 4: Solve trigonometric equations.

- Assessment Plan
    - Assessment Tool: Common Exam Questions
    - Assessment Date: Fall 2017
    - Course section(s)/other population: All sections.
    - Number students to be assessed: All students or a random sample with a maximum of 40 students.
    - How the assessment will be scored: Departmental rubric
    - Standard of success to be used for this assessment: 70% of the students will score 70% or better.

- Who will score and analyze the data: Course Mentor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
40	27

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

There were two sections of Math 178 in the winter of 2019. Data were collected from both sections. 13 students stopped coming to class.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All sections of this course were taught face-to-face.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were assessed using a rubric. The scores on the rubric ranged from 0 - 4.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
74% of the students scored a 3 (41%) or 4 (33%) on the rubric. This meets the standard of success that 70% of the students will score a 70% or higher.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students were asked to solve trigonometric equations. The majority of our students were able to solve equations fairly well.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Some students had difficulty solving equations that contain more than one type of trigonometric functions. Some had difficulties in performing algebraic techniques on an equation. I am planning to give them more practice on the algebraic techniques. These important concepts will continue to be stressed in both lectures & during the final review.

Outcome 5: Solve problems involving radian measure.

- Assessment Plan
    - Assessment Tool: Common Exam Questions
    - Assessment Date: Fall 2017
    - Course section(s)/other population: All sections.
    - Number students to be assessed: All students or a random sample with a maximum of 40 students.
    - How the assessment will be scored: Departmental rubric
    - Standard of success to be used for this assessment: 70% of the students will score 70% or better.
    - Who will score and analyze the data: Course Mentor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2019	

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
40	27

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

There were two sections of Math 178 in the winter of 2019. Data were collected from both sections. 13 students stopped coming to class.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All sections of this course were taught face-to-face.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were assessed using a rubric. The scores on the rubric ranged from 0 - 4.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
89% of the students scored a 3 (7%) or 4 (81%) on the rubric. This meets the standard of success that 70% of the students will score a 70% or higher. Students have an excellent grasp on converting degree measure to radian measure, as well as working with problems involving radian measure.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students were asked to convert degree measure into radian measure and to work with problems involving radian measure. Almost all of our students understood the difference between degree measure and radian measure. Students had an excellent grasp on problems involving radian measure. Almost all of our students could successfully solve these types of problems.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

I am planning to give them more practice problems.

III. Course Summary and Intended Changes Based on Assessment Results

1. Based on the previous report's Intended Change(s) identified in Section I above, please discuss how effective the changes were in improving student learning.

In the previous report there were no intended changes.

2. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

The assessment data indicates that we are meeting the needs of students. This course seems to be meeting the course outcomes very well. Outcome 1: Solve triangles: 85% of our students received a score of 3 & 4. Outcome 2: Graphing trig. functions: 74% of our students received a score of 3 & 4. Outcome 3: Proving Identities: 78% of our students received a score of 3 & 4. Outcome 4: Solving Trig. Equations: 74% of our students received a score of 3 & 4. Outcome 5: Solving problems involving Radian measure: 89% of our students received a score of 3 & 4.

3. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

I will communicate the results of the assessment to the mathematics department emphasizing the areas that need improvement. In addition, the information will be shared with part-time instructors in the upcoming semesters. I will make suggestions to the part-time instructors who will teach the course to give more practice on graphing trigonometric functions and solving trigonometric equations.

4. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date

No changes intended.

5. Is there anything that you would like to mention that was not already captured?

6.

III. Attached Files

Mth178-Assessment Data2019

Faculty/Preparer:	Hanan Wahab	**Date:** 07/24/2019
Department Chair:	Lisa Manoukian	**Date:** 08/12/2019
Dean:	Kimberly Jones	**Date:** 08/13/2019
Assessment Committee Chair:	Shawn Deron	**Date:** 11/11/2019

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Mathematics	178	MTH 178 08/16/2017-General Trigonometry
Division	Department	Faculty Preparer
Math, Science and Engineering Tech	Mathematics	Hanan Wahab
Date of Last Filed Assessment Report		

I. Assessment Results per Student Learning Outcome

Outcome 1: Solve triangles.

- Assessment Plan
    - Assessment Tool: Common Exam Questions
    - Assessment Date: Fall 2017
    - Course section(s)/other population: All sections.
    - Number students to be assessed: All students or a random sample with a maximum of 40 students.
    - How the assessment will be scored: Departmental rubric
    - Standard of success to be used for this assessment: 70% of the students will score 70% or better.
    - Who will score and analyze the data: Course Mentor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2017	2017

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
77	38

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

There were two sections of MTH 178 in winter 2017 and one section in spring/summer 2017. Data was collected from one section in winter 2017 and one section in spring/summer. We were unable to collect the data for the other section in winter term that was taught by a part-time faculty member.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All sections of this course are taught face-to-face.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were assessed using a rubric. The scores on the rubric ranged from 0 - 4.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
82% of the students scored a 3 (8%) or 4 (74%) on the rubric. This meets the standard of success that 70% of the students will score a 70% or higher. The majority of our students are able to solve these types of problems which involve solving triangles of different configurations.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students were able to solve problems involving triangles. Students demonstrated a deep understanding of the problems including an ability to identify the appropriate mathematical concept and achieve the correct response.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Will continue to offer more practice to the students in this area where they need improvement.

Outcome 2: Interpret trigonometric graphs and graph trigonometric functions.

- Assessment Plan
    - Assessment Tool: Common Exam Questions
    - Assessment Date: Fall 2017
    - Course section(s)/other population: All sections.
    - Number students to be assessed: All students or a random sample with a maximum of 40 students.
    - How the assessment will be scored: Departmental rubric
    - Standard of success to be used for this assessment: 70% of the students will score 70% or better.
    - Who will score and analyze the data: Course Mentor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2017	2017

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
77	38

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

There were two sections of MTH 178 in winter 2017 and one section in spring/summer 2017. Data was collected from one section in winter 2017 and one section in spring/summer. We were unable to collect the data for the other section in winter term that was taught by a part-time faculty member.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All sections of this course are taught face-to-face.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were assessed using a rubric. The scores on the rubric ranged from 0 - 4.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
74% of the students scored a 3 (29%) or 4 (45%) on the rubric. This meets the standard of success that 70% of the students will score a 70% or higher. Our students were successful in graphing this type of function.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students were asked to graph a sine trigonometric function. Our students were successful in graphing this type of a function and identifying the important parts of the graph. Most students seem to be confident in their ability to graph this type of function.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Some students had difficulty in identifying the length of the period of the sine wave. Will continue to offer more practice to the students in this area for the final review.

Outcome 3: Prove trigonometric identities.

- Assessment Plan
    - Assessment Tool: Common Exam Questions
    - Assessment Date: Fall 2017
    - Course section(s)/other population: All sections.
    - Number students to be assessed: All students or a random sample with a maximum of 40 students.

- How the assessment will be scored: Departmental rubric
- Standard of success to be used for this assessment: 70% of the students will score 70% or better.
- Who will score and analyze the data: Course Mentor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2017	2017

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
77	38

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

There were two sections of MTH 178 in winter 2017 and one section in spring/summer 2017. Data was collected from one section in winter 2017 and one section in spring/summer. We were unable to collect the data for the other sections in winter term that was taught by a part-time faculty member.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All sections of this course are taught face-to-face.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were assessed using a rubric. The scores on the rubric ranged from 0 - 4.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
76% of the students scored a 3 (11%) or 4 (66%) on the rubric. This meets the standard of success that 70% of the students will score a 70% or higher.

Students have a good grasp on proving identities.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students were asked to prove trigonometric functions. The majority of our students were able to prove identities successfully.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Will continue to offer more practice to the students in this area for the final review to enhance their ability in proving identities.

Outcome 4: Solve trigonometric equations.

- Assessment Plan
    - Assessment Tool: Common Exam Questions
    - Assessment Date: Fall 2017
    - Course section(s)/other population: All sections.
    - Number students to be assessed: All students or a random sample with a maximum of 40 students.
    - How the assessment will be scored: Departmental rubric
    - Standard of success to be used for this assessment: 70% of the students will score 70% or better.
    - Who will score and analyze the data: Course Mentor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2017	2017

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
77	38

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

There were two sections of MTH 178 in winter 2017 and one section in spring/summer 2017. Data was collected from one section in winter 2017 and one section in spring/summer. We were unable to collect the data for the other section in winter term that was taught by a part-time faculty member.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All sections of this course are taught face-to-face.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were assessed using a rubric. The scores on the rubric ranged from 0 - 4.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes
71% of the students scored a 3 (39%) or 4 (32%) on the rubric. This meets the standard of success that 70% of the students will score a 70% or higher.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students were asked to solve trigonometric equations. The majority of our students were able to solve equations fairly well.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

Some students had difficulty solving equations that contain more than one type of trigonometric functions. Some had difficulties in performing algebraic techniques on an equation.

I am planning to give them more practice on the algebraic techniques. These important concepts will continue to be stressed in both lectures & during the final review. There will be some minor adjustments made to the final exam as well.

Outcome 5: Solve problems involving radian measure.

- Assessment Plan
    - Assessment Tool: Common Exam Questions
    - Assessment Date: Fall 2017
    - Course section(s)/other population: All sections.
    - Number students to be assessed: All students or a random sample with a maximum of 40 students.
    - How the assessment will be scored: Departmental rubric
    - Standard of success to be used for this assessment: 70% of the students will score 70% or better.
    - Who will score and analyze the data: Course Mentor

1. Indicate the Semester(s) and year(s) assessment data were collected for this report.

Fall (indicate years below)	Winter (indicate years below)	SP/SU (indicate years below)
	2017	2017

2. Provide assessment sample size data in the table below.

# of students enrolled	# of students assessed
77	38

3. If the number of students assessed differs from the number of students enrolled, please explain why all enrolled students were not assessed, e.g. absence, withdrawal, or did not complete activity.

There were two sections of MTH 178 in winter 2017 and one section in spring/summer 2017. Data was collected from one section in winter 2017 and one section in spring/summer. We were unable to collect the data for the other section in winter term that was taught by a part-time faculty member.

4. Describe how students from all populations (day students on campus, DL, MM, evening, extension center sites, etc.) were included in the assessment based on your selection criteria.

All sections of this course are taught face-to-face.

5. Describe the process used to assess this outcome. Include a brief description of this tool and how it was scored.

Outcome-related questions from the final exam were assessed using a rubric. The scores on the rubric ranged from 0 - 4.

6. Briefly describe assessment results based on data collected for this outcome and tool during the course assessment. Discuss the extent to which students achieved this learning outcome and indicate whether the standard of success was met for this outcome and tool.

Met Standard of Success: Yes

95% of the students scored a 3 (3%) or 4 (92%) on the rubric. This meets the standard of success that 70% of the students will score a 70% or higher.

Students have an excellent grasp on converting degree measure to radian measure, as well as working with problems involving radian measure.

7. Based on your interpretation of the assessment results, describe the areas of strength in student achievement of this learning outcome.

Students were asked to convert degree measure into radian measure and to work with problems involving radian measure. Almost all of our students understand the difference between degree measure and radian measure. Students have an excellent grasp on problems involving radian measure. Almost all of our students can successfully solve these type of problems.

8. Based on your analysis of student performance, discuss the areas in which student achievement of this learning outcome could be improved. If student met standard of success, you may wish to identify your plans for continuous improvement.

I am planning to give them more practice problems.

II. Course Summary and Action Plans Based on Assessment Results

1. Describe your overall impression of how this course is meeting the needs of students. Did the assessment process bring to light anything about student achievement of learning outcomes that surprised you?

The assessment data indicates that we are meeting the needs of students.

This course seems to be meeting the course outcomes very well.

Outcome 1: Solve triangles: 82% of our students received a score of 3 & 4. Outcome 2: Graphing trig. functions: 74% of our students received a score of 3 & 4. Outcome 3: Proving Identities: 76% of our students received a score of 3 & 4. Outcome 4: Solving Trig. Equations: 71% of our students received a score of 3 & 4. Outcome 5: Solving problems involving Radian measure: 95% of our students received a score of 3 & 4.

2. Describe when and how this information, including the action plan, was or will be shared with Departmental Faculty.

I will communicate the results of the assessment to the mathematics department emphasizing the areas that need improvement. In addtion, the information will be shared with part-time instructors in the upcoming semesters. There will be some minor adjustments to the final exam.

3. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
No changes intended.			

4. Is there anything that you would like to mention that was not already captured?

5.

III. Attached Files

Assessment Data

Faculty/Preparer:	Hanan Wahab	**Date:**	08/18/2017
Department Chair:	Lisa Rombes	**Date:**	08/21/2017
Dean:	Kristin Good	**Date:**	08/24/2017
Assessment Committee Chair:	Michelle Garey	**Date:**	10/30/2017

COURSE ASSESSMENT REPORT

I. Background Information

1. Course assessed:
   Course Discipline Code and Number: MTH178
   Course Title: General Trigonometry
   Division/Department Codes:

2. Semester assessment was conducted (check one):
   ☐ Fall 20__
   x Winter 2008
   ☐ Spring/Summer 20__

3. Assessment tool(s) used: check all that apply.
   ☐ Portfolio
   ☐ Standardized test
   ☐ Other external certification/licensure exam (specify):
   ☐ Survey
   ☐ Prompt
   x Departmental exam
   ☐ Capstone experience (specify):
   ☐ Other (specify):

4. Have these tools been used before?
   ☐ Yes
   x No

   If yes, have the tools been altered since its last administration? If so, briefly describe changes made.

5. Indicate the number of students assessed/total number of students enrolled in the course.
   Total students assessed = 57. Total students enrolled in course = 148 (38.5%)

6. Describe how students were selected for the assessment.
   Present in class for penultimate session.

II. Results

1. Briefly describe the changes that were implemented in the course as a result of the previous assessment.

2. State each outcome (verbatim) from the master syllabus for the course that was assessed.
   Outcome#1: Solve triangles.
   Outcome#3: Prove trigonometric identities
   Outcome#4: Solve trigonometric equations
   Outcome#5: Solve problems involving radian measure.

3. Briefly describe assessment results based on data collected during the course assessment, demonstrating the extent to which students are achieving each of the learning outcomes listed above. ***Please attach a summary of the data collected.***
   See attached spreadshee t outcome #1 yes w/ 78.9% Outcome #3 yes w/86% outcome #4 No w/42% Outcome #5 NO w/69% flg

4. For each outcome assessed, indicate the standard of success used, and the percentage of students who achieved that level of success. ***Please attach the rubric/scoring guide used for the assessment.***
   At least 70% of students must meet at least 70% of all learning outcomes.

5. Describe the areas of strength and weakness in students' achievement of the learning outcomes shown in assessment results.
   Strengths: Outcome#1 and outcome#3

COURSE ASSESSMENT REPORT

Weaknesses: Outcome#4 and outcome#5

III. Changes influenced by assessment results

1. If weaknesses were found (see above) or students did not meet expectations, describe the action that will be taken to address these weaknesses.
   Increased practice problems for outcomes#4 and #5; integration of these topics into succeeding work.

2. Identify intended changes that will be instituted based on results of this assessment activity (check all that apply). Please describe changes and give rationale for change.
   a. ☐ Outcomes/Assessments on the Master Syllabus
      Change/rationale:

   b. ☐ Objectives/Evaluation on the Master Syllabus
      Change/rationale:

   c. ☐ Course pre-requisites on the Master Syllabus
      Change/rationale:

   d. ☐ 1st Day Handouts
      Change/rationale:

   e. x Course assignments
      Change/rationale: Increased problem-solving should remediate the present results.

   f. ☐ Course materials (check all that apply)
      ☐ Textbook
      ☐ Handouts
      x Other: more practice problems on Blackboard

   g. ☐ Instructional methods
      Change/rationale:

   h. ☐ Individual lessons & activities
      Change/rationale:

3. What is the timeline for implementing these actions? Fall semester 2009

IV. Future plans

1. Describe the extent to which the assessment tools used were effective in measuring student achievement of learning outcomes for this course.
   Not necessarily representative of students' overall abilities.
2. If the assessment tools were not effective, describe the changes that will be made for future assessments.
   MTH178 instructors will assess the assessment tool.
3. Which outcomes from the master syllabus have been addressed in this report?
   All _____ Selected #1, #3, #4, #5
   If "All", provide the report date for the next full review: _____.
   If "Selected", provide the report date for remaining outcomes: ____Fall 2009_____.

Submitted by:

Name: _____David Goldberg_____ David Goldberg Date: ~~June 10~~ 11/24 2008
Print/Signature

Department Chair: _____ Kristi Gluck Date: 11.24.08
Print/Signature

Please return completed form to the Office of Curriculum & Assessment, SC 247.

Approved by the Assessment Committee 10/10/06

COURSE ASSESSMENT REPORT

Dean: M. Hoover Date: _____
Print/Signature

logged 12/1/08 sf

Please return completed form to the Office of Curriculum & Assessment, SC 247.

Approved by the Assessment Committee 10/10/06