Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Mathematics	169	MTH 169 08/17/2021-Intermediate Algebra
College	Division	Department
	Math, Science and Engineering Tech	Math & Engineering Studies
Faculty Preparer		Brenda Foster
Date of Last Filed Assessment Report		08/26/2020

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

   August 2019

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

   Students met the course standards for Outcome 2.

   Overall 67% of students scored 70% or better for Outcome 1.

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

   More emphasis for Outcome 1 was needed for further improvement, student-wise. More improvement for online sections was needed. Videos for homework were added to course across sections; both online and face-to-face.

II. Assessment Results per Student Learning Outcome

Outcome 1: Sketch and transform accurate graphs of quadratic, rational, radical, exponential and logarithmic functions.

- Assessment Plan
  - Assessment Tool: Common departmental exam questions administered to students in all sections
  - Assessment Date: Winter 2022

- Course section(s)/other population: All
- Number students to be assessed: All
- How the assessment will be scored: Members of the math department will collect and score the questions. A four point rubric will be used to score each question.
- Standard of success to be used for this assessment: 70% of students must score at least 70% on the outcome related questions.
- Who will score and analyze the data: A committee of department members, led by the course mentor, will score the questions and analyze the data

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		

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

# of students enrolled	# of students assessed
192	50

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.

The final exams for all 192 students were numbered. A random number generator was used to select 50 exams.

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.

The exams sampled were taken across all sections, both virtual classroom and online.

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

Students were asked to perform the following tasks: Sketch and transform accurate graphs of quadratic, rational, radical, exponential, and logarithmic functions. A 5-point rubric was used to assess this outcome.

5 points - The student provides correct solutions and strategies. The student explains and justifies his/her thinking thoroughly and clearly. The student connects and applies the standards in complex ways.

4 points - The student provides mostly correct solutions and strategies with minor errors. The student justifies his/her thinking. The student demonstrates mastery of the standards that were explicitly taught.

3 points - The student demonstrates some correct thinking about solutions and strategies. Student explains their thinking but it may be hard to follow. The student demonstrates partial understanding of the standards that were explicitly taught.

2 point - The student demonstrates some evidence of mathematical thinking, but shows little understanding. The student offers little explanation of his/her thinking or what is offered does not make sense. The student demonstrates minimal or no understanding of the standard.

1 points - No evidence of attempting the task, though some work is evident.

0 points - Blank space

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
Objective 1 - 100% of students earned 3.5 points (70%) or better for questions 6 and 13. Objective 2 - 100% of students earned 3.5 points (70%) or better for questions 5 and 9. Overall for Outcome 1 - 100% of students earned 70% or better for Outcome 1.

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

I am very pleased with the improvement students have made in this area. The results are higher than expected because the final exam was not proctored due to the pandemic.

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 re-institute proctoring the final exam with the addition of allowing students to use notes/text during the exam. However, this may not occur immediately given the current uptick of COVID-19 cases/deaths at this time.

Outcome 2: Simplify expressions and solve problems involving functions and equations using algebraic concepts.

- Assessment Plan
    - Assessment Tool: Common departmental exam questions administered to students in all sections
    - Assessment Date: Winter 2022
    - Course section(s)/other population: All
    - Number students to be assessed: All
    - How the assessment will be scored: Members of the math department will collect and score the questions. A four point rubric will be used to score each question.
    - Standard of success to be used for this assessment: 70% of students must score at least 70% on the outcome related questions.
    - Who will score and analyze the data: A committee of department members, led by the course mentor, will score the questions and analyze the data

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		

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

# of students enrolled	# of students assessed
192	50

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.

The final exams for all 192 students were numbered. A random number generator was used to select 50 exams.

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.

The exams sampled were taken across all sections, both virtual classroom and online.

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

Students were asked to perform the following tasks: Simplify rational expressions, solve rational equations, simplify radical expressions, solve radical equations, solve quadratic equations, and solve exponential and logarithmic equations. A 5-point rubric was used to assess this outcome. 5 points - The student provides correct solutions and strategies. The student explains and justifies his/her thinking thoroughly and clearly. The student connects and applies the standards in complex ways. 4 points - The student provides mostly correct solutions and strategies with minor errors. The student justifies his/her thinking. The student demonstrates mastery of the standards that were explicitly taught. 3 points - The student demonstrates some correct thinking about solutions and strategies. Student explains their thinking but it may be hard to follow. The student demonstrates partial understanding of the standards that were explicitly taught. 2 point - The student demonstrates some evidence of mathematical thinking, but shows little understanding. The student offers little explanation of his/her thinking or what is offered does not make sense. The student demonstrates minimal or no understanding of the standard. 1 points - No evidence of attempting the task, though some work is evident. 0 points - Blank space

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

Objective 3 - 100% of students earned 3.5 points (70%) or better for questions 3, 8, 14, and 15.

Objective 4 - 94% of students (47/50) earned 3.5 points (70%) or better for questions 1 and 8.

Objective 5 - 94% of students (47/50) earned 3.5 points (70%) or better for questions 1 and 2.

Objective 6 - 96% of students (48/50) earned 3.5 points (70%) or better for questions 4 and 7.

Overall Outcome 2 - 96% of students earned 70% or better for Outcome 2.

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

I am very pleased with the improvement students have made in this area. The results are higher than expected because the final exam was not proctored due to the pandemic.

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 re-institute proctoring the final exam with the addition of allowing students to use notes/text during the exam. However, this may not occur immediately given the current uptick of COVID-19 cases/deaths at this time.

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.

The addition of video tutorials to the homework assignments was a tremendous success. However, the level of success may have been enhanced by administering the final exam as not being proctored.

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?

This course is meeting the needs of students. I am happy to see the gap between virtual classroom sections and online sections closing in a positive manner. I am surprised by the dramatic improvement by all students. I think this improvement

is two-fold; video tutorials in the homework and administering the final exam as not being proctored.

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

I plan to share these assessment results, including the action plan, to my department during the Fall 2021 In-service.

4. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Assessment Tool	A random sample of all students from all sections will be used to assess the course.	Statistically, the population of the course is large enough to satisfy the use of a random sample of more than 30 students to represent the population accurately.	2020
Assessment Tool	I plan to proctor the final exam and allow the students to use notes/text.	This course is both a gateway course and terminal course depending on a student's academic and vocational goals. For those students who are using this course to end their mathematical studies, a proctored final exam allowing notes and/or use of the textbook more than support their academic and vocational goals. Students intending to continue through the mathematics	2020

		series will also be supported given their continued study in the discipline.	

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

6.

III. Attached Files

MTH 169 Assessment Data
Rubric

Faculty/Preparer:	Brenda Foster	**Date:** 08/28/2021
Department Chair:	Lawrence David	**Date:** 08/31/2021
Dean:	Victor Vega	**Date:** 09/13/2021
Assessment Committee Chair:	Shawn Deron	**Date:** 10/30/2021

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Mathematics	169	MTH 169 08/06/2019-Intermediate Algebra
Division	Department	Faculty Preparer
Math, Science and Engineering Tech	Math & Engineering Studies	Brenda Foster
Date of Last Filed Assessment Report		10/19/2017

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

   July 2017

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

   Students met the course standards.

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

   No changes were intended.

II. Assessment Results per Student Learning Outcome

Outcome 1: Sketch and transform accurate graphs of quadratic, rational, radical, exponential and logarithmic functions.

- Assessment Plan
  - Assessment Tool: Common departmental exam questions administered to students in all sections
  - Assessment Date: Fall 2020
  - Course section(s)/other population: All
  - Number students to be assessed: All

- How the assessment will be scored: Members of the math department will collect and score the questions. A four point rubric will be used to score each question.
- Standard of success to be used for this assessment: 70% of students must score at least 70% on the questions
- Who will score and analyze the data: A committee of department members, led by the course mentor, will score the questions and analyze the data

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
212	60

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.

Sampling Using a Random Number Generator

Exams from all 212 students were numbered. A random number generator was used to random select 60 students for the assessment process. The 212 students are across all sections, both face-to-face and online.

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.

Sampling Using a Random Number Generator

Exams from all 212 students were numbered. A random number generator was used to random select 60 students for the assessment process. The 212 students are across all sections, both face-to-face and online.

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

Students were asked to perform the following tasks: Simplify rational expressions, solve rational equations, simplify radical expressions, solve radical equations, solve quadratic equations, and solve exponential and logarithmic equations.

A 5-point rubric was used to assess this outcome.

5 points - The student provides correct solutions and strategies. The student explains and justifies his/her thinking thoroughly and clearly. The student connects and applies the standards in complex ways.

4 points - The student provides mostly correct solutions and strategies with minor errors. The student justifies his/her thinking. The student demonstrates mastery of the standards that were explicitly taught.

3 points - The student demonstrates some correct thinking about solutions and strategies. Student explains their thinking but it may be hard to follow. The student demonstrates partial understanding of the standards that were explicitly taught.

2 point - The student demonstrates some evidence of mathematical thinking, but shows little understanding. The student offers little explanation of his/her thinking or what is offered does not make sense. The student demonstrates minimal or no understanding of the standard.

1 points - No evidence of attempting the task, though some work is evident.

0 points - Blank space

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: No
Question 6 - 78% of students scored 4 points (80%) or better. Question 9f - 70% of students scored 4 points (80%) or better. Question 13 - 72% of students scored 4 points (80%) or better. Overall, 67% of students scored 70% or better for Outcome 1.

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

There was improvement for this outcome question-wise. Overall, students are understanding the family of functions and their transformations in the plane.

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.

More emphasis for this outcome is needed overall for further improvement student-wise. More improvement for online sections is needed. Videos for homework will be added to course across sections; both online and face-to-face.

Outcome 2: Simplify expressions and solve problems involving functions and equations using algebraic concepts.

- Assessment Plan
    - Assessment Tool: Common departmental exam questions administered to students in all sections
    - Assessment Date: Fall 2020
    - Course section(s)/other population: All
    - Number students to be assessed: All
    - How the assessment will be scored: Members of the math department will collect and score the questions. A four point rubric will be used to score each question.
    - Standard of success to be used for this assessment: 70% of students must score at least 70% on the questions
    - Who will score and analyze the data: A committee of department members, led by the course mentor, will score the questions and analyze the data

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
212	60

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.

Sampling Using a Random Number Generator

The final exams for all 212 students were numbered. A random number generator was used to select 60 exams. The exams sampled were taken across all sections, both face-to-face and online.

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.

Sampling Using a Random Number Generator

The final exams for all 212 students were numbered. A random number generator was used to select 60 exams. The exams sampled were taken across all sections, both face-to-face and online.

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

Students were asked to perform the following tasks: Simplify rational expressions, solve rational equations, simplify radical expressions, solve radical equations, solve quadratic equations, and solve exponential and logarithmic equations.

A 5-point rubric was used to assess this outcome.

5 points - The student provides correct solutions and strategies. The student explains and justifies his/her thinking thoroughly and clearly. The student connects and applies the standards in complex ways.

4 points - The student provides mostly correct solutions and strategies with minor errors. The student justifies his/her thinking. The student demonstrates mastery of the standards that were explicitly taught.

3 points - The student demonstrates some correct thinking about solutions and strategies. Student explains their thinking but it may be hard to follow. The student demonstrates partial understanding of the standards that were explicitly taught.

2 point - The student demonstrates some evidence of mathematical thinking, but shows little understanding. The student offers little explanation of his/her thinking or what is offered does not make sense. The student demonstrates minimal or no understanding of the standard.

1 points - No evidence of attempting the task, though some work is evident.

0 points - Blank space

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: No
Question 3 - 88% of students earned 4 points (80%) or better. Question 4 - 72% of students earned 4 points (80%) or better. Question 5 - 52% of students earned 4 points (80%) or better. Question 8 - 96% of students earned 4 points (80%) or better. Question 9a - 74% of students earned 4 points (80%) or better. Question 14 - 87% of students earned 4 points (80%) or better. Question 15 - 92% of students earned 4 points (80%) or better. Overall Outcome 2 - 62% of students earned 70% or better for Outcome 2.

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

Students are doing very well in most areas for this outcome. I am pleased with the results.

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.

Standards were not met for this outcome. More improvement in factoring is always desirable. Videos will be included in homework assignments.

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.

More time and earlier introduction to families of functions was helpful. However, I think a continued discussion of functions and their graphs will increase understanding and retention.

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?

This course is meeting the needs of the student. Improvement is slow, and students continue to struggle more so in online sections. This is not surprising. I'm hoping that the addition of videos as part of homework assignments will be helpful in the online sections. However, this inclusion will also apply to face-to-face sections.

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

I plan to present the assessment results, including the action plan, to my department during Fall 2019 In-service.

4. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Course Materials (e.g. textbooks, handouts, on-line ancillaries)	Students are using Connect Math for homework assignments. I will include videos for each homework assignment. These videos will be listed as homework assignments in Connect Math.	I'm hoping that these videos will provide additional "snippets" of information that is specific to the task at hand. I'm encouraged that this will help students follow through when experiencing challenges while completing homework assignments.	2019

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

6.

III. Attached Files

Assessment Data MTH 169 August 6, 2019
Rubric (Truncated Version)

Faculty/Preparer:	Brenda Foster	**Date:**	08/14/2019
Department Chair:	Lisa Manoukian	**Date:**	09/19/2019
Dean:	Victor Vega	**Date:**	09/27/2019
Assessment Committee Chair:	Shawn Deron	**Date:**	08/25/2020

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Mathematics	169	MTH 169 08/06/2019-Intermediate Algebra
Division	Department	Faculty Preparer
Math, Science and Engineering Tech	Mathematics	Brenda Foster
Date of Last Filed Assessment Report		10/19/2017

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

   July 2017

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

   Students met the course standards.

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

   No changes were intended.

II. Assessment Results per Student Learning Outcome

Outcome 1: Sketch and transform accurate graphs of quadratic, rational, radical, exponential and logarithmic functions.

- Assessment Plan
    - Assessment Tool: Common departmental exam questions administered to students in all sections
    - Assessment Date: Fall 2020
    - Course section(s)/other population: All
    - Number students to be assessed: All
    - How the assessment will be scored: Members of the math department will collect and score the questions. A four point rubric will be used to score each question.
    - Standard of success to be used for this assessment: 70% of students must score at least 70% on the questions
    - Who will score and analyze the data: A committee of department members, led by the course mentor, will score the questions and analyze the data

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
212	60

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.

Sampling Using a Random Number Generator
Exams from all 212 students were numbered. A random number generator was used to random select 60 students for the assessment process. The 212 students are across all sections, both face-to-face and online.

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.

Sampling Using a Random Number Generator

Exams from all 212 students were numbered. A random number generator was used to random select 60 students for the assessment process. The 212 students are across all sections, both face-to-face and online.

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

Students were asked to perform the following tasks: Simplify rational expressions, solve rational equations, simplify radical expressions, solve radical equations, solve quadratic equations, and solve exponential and logarithmic equations.

A 5-point rubric was used to assess this outcome.

5 points - The student provides correct solutions and strategies. The student explains and justifies his/her thinking thoroughly and clearly. The student connects and applies the standards in complex ways.

4 points - The student provides mostly correct solutions and strategies with minor errors. The student justifies his/her thinking. The student demonstrates mastery of the standards that were explicitly taught.

3 points - The student demonstrates some correct thinking about solutions and strategies. Student explains their thinking but it may be hard to follow. The student demonstrates partial understanding of the standards that were explicitly taught.

2 point - The student demonstrates some evidence of mathematical thinking, but shows little understanding. The student offers little explanation of his/her thinking or what is offered does not make sense. The student demonstrates minimal or no understanding of the standard.

1 points - No evidence of attempting the task, though some work is evident.

0 points - Blank space

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: No

Question 6 - 78% of students scored 4 points (80%) or better.

Question 9f - 70% of students scored 4 points (80%) or better.

Question 13 - 72% of students scored 4 points (80%) or better. Overall, 67% of students scored 70% or better for Outcome 1.

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

There was improvement for this outcome question-wise. Overall, students are understanding the family of functions and their transformations in the plane.

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.

More emphasis for this outcome is needed overall for further improvement student-wise. More improvement for online sections is needed. Videos for homework will be added to course across sections; both online and face-to-face.

Outcome 2: Simplify expressions and solve problems involving functions and equations using algebraic concepts.

- Assessment Plan
    - Assessment Tool: Common departmental exam questions administered to students in all sections
    - Assessment Date: Fall 2020
    - Course section(s)/other population: All
    - Number students to be assessed: All
    - How the assessment will be scored: Members of the math department will collect and score the questions. A four point rubric will be used to score each question.
    - Standard of success to be used for this assessment: 70% of students must score at least 70% on the questions
    - Who will score and analyze the data: A committee of department members, led by the course mentor, will score the questions and analyze the data

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
212	60

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.

Sampling Using a Random Number Generator

The final exams for all 212 students were numbered. A random number generator was used to select 60 exams. The exams sampled were taken across all sections, both face-to-face and online.

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.

Sampling Using a Random Number Generator

The final exams for all 212 students were numbered. A random number generator was used to select 60 exams. The exams sampled were taken across all sections, both face-to-face and online.

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

Students were asked to perform the following tasks: Simplify rational expressions, solve rational equations, simplify radical expressions, solve radical equations, solve quadratic equations, and solve exponential and logarithmic equations.

A 5-point rubric was used to assess this outcome.

5 points - The student provides correct solutions and strategies. The student explains and justifies his/her thinking thoroughly and clearly. The student connects and applies the standards in complex ways.

4 points - The student provides mostly correct solutions and strategies with minor errors. The student justifies his/her thinking. The student demonstrates mastery of the standards that were explicitly taught.

3 points - The student demonstrates some correct thinking about solutions and strategies. Student explains their thinking but it may be hard to follow. The student demonstrates partial understanding of the standards that were explicitly taught.

2 point - The student demonstrates some evidence of mathematical thinking, but shows little understanding. The student offers little explanation of his/her thinking or what is offered does not make sense. The student demonstrates minimal or no understanding of the standard.

1 points - No evidence of attempting the task, though some work is evident.

0 points - Blank space

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: No
Question 3 - 88% of students earned 4 points (80%) or better. Question 4 - 72% of students earned 4 points (80%) or better. Question 5 - 52% of students earned 4 points (80%) or better. Question 8 - 96% of students earned 4 points (80%) or better. Question 9a - 74% of students earned 4 points (80%) or better. Question 14 - 87% of students earned 4 points (80%) or better. Question 15 - 92% of students earned 4 points (80%) or better. Overall Outcome 2 - 62% of students earned 70% or better for Outcome 2.

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

Students are doing very well in most areas for this outcome. I am pleased with the results.

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.

Standards were not met for this outcome. More improvement in factoring is always desirable. Videos will be included in homework assignments.

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.

   More time and earlier introduction to families of functions was helpful. However, I think a continued discussion of functions and their graphs will increase understanding and retention.

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?

   This course is meeting the needs of the student. Improvement is slow, and students continue to struggle more so in online sections. This is not surprising. I'm hoping that the addition of videos as part of homework assignments will be helpful in the online sections. However, this inclusion will also apply to face-to-face sections.

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

   I plan to present the assessment results, including the action plan, to my department during Fall 2019 In-service.

4. Intended Change(s)

Intended Change	Description of the change	Rationale	Implementation Date
Course Materials (e.g. textbooks, handouts, on-line ancillaries)	Students are using Connect Math for homework assignments. I will include videos for each homework assignment. These videos will be listed as homework assignments in Connect Math.	I'm hoping that these videos will provide additional "snippets" of information that is specific to the task at hand. I'm encouraged that this will help students follow through when experiencing challenges while completing	2019

		homework assignments.	

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

6.

III. Attached Files

Assessment Data MTH 169 August 6, 2019
Rubric (Truncated Version)

Faculty/Preparer:	Brenda Foster	**Date:** 08/14/2019
Department Chair:	Lisa Manoukian	**Date:** 09/19/2019
Dean:	Victor Vega	**Date:** 09/27/2019
Assessment Committee Chair:	Shawn Deron	**Date:** 08/25/2020

Course Assessment Report
Washtenaw Community College

Discipline	Course Number	Title
Mathematics	169	MTH 169 07/10/2017-Intermediate Algebra
Division	Department	Faculty Preparer
Math, Science and Engineering Tech	Mathematics	Brenda Foster
Date of Last Filed Assessment Report		

I. Assessment Results per Student Learning Outcome

Outcome 1: Sketch and transform accurate graphs of quadratic, rational, radical, exponential and logarithmic functions.

- Assessment Plan
    - Assessment Tool: Common departmental exam questions administered to students in all sections.
    - Assessment Date: Fall 2010
    - Course section(s)/other population: All
    - Number students to be assessed: All
    - How the assessment will be scored: Members of the math department will collect and score the questions. A four point rubric will be used to score each question.
    - Standard of success to be used for this assessment: 70% of students earning a C or better must score at least 70% on the questions.
    - Who will score and analyze the data: A committee of department members, led by the course mentor, will blind score the questions and analyze the data.

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)
2016	2017	

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

# of students enrolled	# of students assessed
678	50

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.

Withdrawal, absence, and sampling.

I obtained my sample of 50 exams by numbering all of the available exams and then using a unique random number generator to select the 50. The paper and pencil exam was given to online sections as well as to face-to-face sections. The online sections were included in the exams that were sampled.

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.

The assessment tool was a paper and pencil final exam. All students across all modes and locations of course delivery were given the paper and pencil final exam.

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

Students were asked to graph the following functions: quadratic, rational, and absolute value.

A 4-point rubric was used to assess this outcome.

4 points - The student provides correct solutions and strategies. The student explains and justifies his/her thinking thoroughly and clearly. The student connects and applies the standards in complex ways.

3 points - The student provides mostly correct solutions and strategies with minor errors. The student justifies his/her thinking. The student demonstrates mastery of the standards that were explicitly taught.

2 points - The student demonstrates some correct thinking about solutions and strategies. Student explains their thinking but it may be hard to follow. The student demonstrates partial understanding of the standards that were explicitly taught.

1 point - The student demonstrates some evidence of mathematical thinking, but shows little understanding. The student offers little explanation of his/her thinking or what is offered does not make sense. The student demonstrates minimal or no understanding of the standard.

0 points - No evidence of attempting the task.

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
quadratic function: 76% of the students were able to graph this function at a level of 3 (out of 4 possible points) or better. The students provided mostly correct solutions and strategies with minor errors. **rational function:** 62% of the students were able to graph this function at a level of 3 (out of 4 possible points) or better. The students provided mostly correct solutions and strategies with minor errors. **absolute value function**: 82% of the students were able to graph this function at a level of 3 (out of 4 possible points) or better. The students provided mostly correct solutions and strategies with minor errors.

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

Students met the standard of success.

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 allow more time in this area; specifically an earlier introduction to the families of functions, and then an earlier introduction of function translations. There is room for improvement in the demonstration and understanding of function translations.

Outcome 2: Simplify expressions and solve problems involving functions and equations using algebraic concepts.

- Assessment Plan
    - Assessment Tool: Common departmental exam questions administered to students in all sections.
    - Assessment Date: Fall 2010

- Course section(s)/other population: All
- Number students to be assessed: All
- How the assessment will be scored: Members of the math department will collect and score the questions. A four point rubric will be used to score each question.
- Standard of success to be used for this assessment: 70% of students earning a C or better must score at least 70% on the questions.
- Who will score and analyze the data: A committee of department members, led by the course mentor, will blind score the questions and analyze the data.

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)
2016	2017	

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

# of students enrolled	# of students assessed
678	50

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.

Withdrawal, absence, and sampling.

I obtained my sample of 50 exams by numbering all of the available exams and then using a unique random number generator to select the 50. The paper and pencil exam was given to online sections as well as to face-to-face sections. The online sections were included in the exams that were sampled.

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.

The assessment tool was a paper and pencil final exam. All students across all modes and locations of course delivery were given the paper and pencil final exam.

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

Students were asked to perform the following tasks: Simplify rational expressions, solve rational equations, simplify radical expressions, solve radical equations, solve quadratic equations, and solve exponential and logarithmic equations.

A 4-point rubric was used to assess this outcome.

4 points - The student provides correct solutions and strategies. The student explains and justifies his/her thinking thoroughly and clearly. The student connects and applies the standards in complex ways.

3 points - The student provides mostly correct solutions and strategies with minor errors. The student justifies his/her thinking. The student demonstrates mastery of the standards that were explicitly taught.

2 points - The student demonstrates some correct thinking about solutions and strategies. Student explains their thinking but it may be hard to follow. The student demonstrates partial understanding of the standards that were explicitly taught.

1 point - The student demonstrates some evidence of mathematical thinking, but shows little understanding. The student offers little explanation of his/her thinking or what is offered does not make sense. The student demonstrates minimal or no understanding of the standard.

0 points - No evidence of attempting the task.

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
Simplifying rational expressions: 76% of the students were able to graph this function at a level of 3 (out of 4 possible points) or better. The students provided mostly correct solutions and strategies with minor errors. **Solving rational equations**: 73% of the students were able to graph this function at a level of 3 (out of 4 possible points) or better. The students provided mostly correct solutions and strategies with minor errors. **Simplifying radical expression**: 81% of the students were able to graph this function at a level of 3 (out of 4 possible points) or better. The students provided mostly correct solutions and strategies with minor errors.

Solving radical equations: 84% of the students were able to graph this function at a level of 3 (out of 4 possible points) or better. The students provided mostly correct solutions and strategies with minor errors.

Solving quadratic equations: 79% of the students were able to graph this function at a level of 3 (out of 4 possible points) or better. The students provided mostly correct solutions and strategies with minor errors.

Solve exponential and logarithmic equations: 70% of the students were able to graph this function at a level of 3 (out of 4 possible points) or better. The students provided mostly correct solutions and strategies with minor errors.

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

Students met the standard of success.

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.

More emphasis on the distinction between an expression and an equation will lend better understanding in this area across the board. An earlier introduction and a continual thread of this concept throughout the course will strengthen student understanding.

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?

I feel good about student success for this course. I was surprised to see that my students have met the standards for this course. However, it is clear that students can improve. Clear exposure in areas that are new to the students will be my emphasis in the coming semesters. I'm excited!

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

I plan to present the assessment results, including the action plan, to my colleagues during our Fall 2017 in-service department meeting.

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 Tool FE MTH 169
Rubric for MTH 169
Summary Data for MTH 169

Faculty/Preparer:	Brenda Foster	**Date:**	07/11/2017
Department Chair:	Lisa Rombes	**Date:**	07/12/2017
Dean:	Kristin Good	**Date:**	07/13/2017
Assessment Committee Chair:	Michelle Garey	**Date:**	10/18/2017