

COLLEGE OF THE CANYONS

*Santa Clarita Community College District
26455 Rockwell Canyon, Santa Clarita, CA 91355*

Office of Institutional Development and Technology

Math Progression Analysis: Fall 2005-2007

Daylene M. Meuschke, Ed.D.
Catherine Parker, M.A.
Barry C. Gibbons, Ph.D.

April 2011



Table of Contents

Introduction..... 3
Methods..... 3
Results..... 5
Summary of Findings..... 9
Recommendations..... 11
Appendix A..... A-1

Index of Tables

Table 1: Progression Rates for Math-025 Completers: Fall 2005, 2006 and 2007 5
Table 2: Progression Rates for Math-026 Completers: Fall 2005, 2006 and 2007 5
Table 3 Progression Rates for Math-058 Completers: Fall 2005, 2006 and 2007 6
Table 4: Progression Rates for Math-059 Completers: Fall 2005, 2006 and 2007 7
Table 5: Progression Rates for Math-060 Completers: Fall 2005, 2006 and 2007 7
Table 6: Progression Rates for Math-070 Completers: Fall 2005, 2006 and 2007 8

Introduction

At the request of the math department, the Office of Institutional Development and Technology conducted analyses to identify the progression path for students taking math courses below transfer level at College of the Canyons. More specifically, this study intended to answer the following question:

What are the progression rates for students at each entry point in the math sequence below Math-102 (025, 058, 059, 060, 070, 083) by cohort year (Fall 2005, 2006 and 2007)?

The results of this study are intended to help inform the math department's decision-making and planning processes for basic skills curriculum.

Methods

To answer each research question, Cal-PASS research staff performed the analyses (Fall 2005 - Fall 2009). Cohorts were created based on the entry point at which students began the math sequence for Math-025, 026, 058, 059, 060, 070, and 083. Three cohort years were used including Fall 2005, Fall 2006 and Fall 2007. Students in each entry point were only included if they successfully passed that entry point and were eligible to enroll in the next course in the math sequence.

Definitions:

Throughout this report, the following definitions are used:

- **Math-025 Completers:** defined as students who successfully passed Math-025 in the fall term. Cohorts were established for 2005, 2006, and 2007. Students were tracked for two years (e.g. Fall 2005 cohort tracked through Fall 2007).
- **Math-026 Completers:** defined as students who successfully passed Math-026 in the fall term. Cohorts were established for 2005, 2006, and 2007. Students were tracked for two years (e.g. Fall 2005 cohort tracked through Fall 2007).
- **Math-058/059 Completers:** defined as students who successfully passed Math-058 in the fall term. Cohorts were established for 2005, 2006, and 2007. Students were tracked for two years (e.g. Fall 2005 cohort tracked through Fall 2007).
- **Math-059 Completers:** defined as students who successfully passed Math-059 in the fall term. Cohorts were established for 2005, 2006, and 2007. Students were tracked for two years (e.g. Fall 2005 cohort tracked through Fall 2007).

- **Math-060 Completers:** defined as students who successfully passed Math-060 in the fall term. Cohorts were established for 2005, 2006, and 2007. Students were tracked for two years (e.g. Fall 2005 cohort tracked through Fall 2007).
- **Math-063/083 Completers:** defined as students who successfully passed Math-063 in the fall term. Cohorts were established for 2005, 2006, and 2007. Students were tracked for two years (e.g. Fall 2005 cohort tracked through Fall 2007).
- **Math-070 Completers:** defined as students who successfully passed Math-070 in the fall term. Cohorts were established for 2005, 2006, and 2007. Students were tracked for two years (e.g. Fall 2005 cohort tracked through Fall 2007).
- **Total N:** defined as total number of students who attempted the course, even if they were not successful.
- **Progression:** defined as students advancing to the next level in the math course sequence.
- **Science/Technology/Mathematics (STEM) Course Sequence:** [Math-025 or 026] -> [Math 058 or 059]-> Math 060-> Math-[070 or 083]-> [Math-102 103,104, 211, 212, 213, 214, 215].
- **Non-Science/Technology/Mathematics (STEM) Course Sequence:** [Math-025 or 026] -> [Math 058 or 059]-> Math 060-> Math-[070 or 083]-> [Math-140,130, 111 or 240].
- **Course Success:** defined as the percent of students successful in courses out of total enrolled in courses: Numerator = Number of students (duplicated) with A, B, C, CR/P; Denominator = Number of students (duplicated) with A, B, C, D, F, FW, CR/P, NC/NP, W, I. (This analysis uses the RP Group definition, which facilitates statewide comparisons.)

Notes:

- 1.) In Fall 2006, Math-083 was called Math-063. For the 2006 cohort year, tracking is from Math-063. This changes in Fall 2007. For cohort years Fall 2007 and 2008, tracking is from Math 083.
- 2.) Some students were seen enrolled in Math-083 (Geometry) while enrolled in transfer level math courses. Math-083 is a prerequisite for Math-102 (Trigonometry).
- 3.) “—” indicates no student records were found.
- 4.) “*” indicates less than five students. A limitation of outsourcing with Cal-PASS is that they do not report out when results show less than five records.

Results

What are the progression rates for students at each entry point in the math sequence below Math-102 (025, 058, 059, 060, 070, and 083) by cohort year (Fall 2005, 2006 and 2007)?

Math-025 (Arithmetic): Of the students who started in Math-025 and successfully completed the course, Math-025 was the highest level achieved for **30 to 45 percent** of the students who started at this level (see Table 1). On average, Math-025 was the highest level achieved for **36 percent** of the students. Math-058 (Algebra Preparation) was the highest level achieved for **24 to 29 percent** of students who started in Math-025. On average, Math-058 was the highest level achieved for **26 percent** of the students. Math-060 (Elementary Algebra) was the highest level achieved for **18 to 23 percent** of students who started in Math-025. On average, Math-060 was the highest level achieved for **20 percent** of the students. *Less than 10 percent* of students who started at Math-025 progressed to Math-070 (Intermediate Algebra).

Math 025	Math 025 Completers (N)	Math 025	Math 058	Math 059	Math 060	Math 070	Math 083	Transfer STEM Path	Transfer Non STEM Path
Fall 2005	64	34%	25%	*	19%	9%	--	*	*
Fall 2006	121	45%	24%	--	18%	7%	*	*	*
Fall 2007	142	30%	29%	*	23%	8%	*	*	*
Average		36%	26%	*	20%	8%	*	*	*

Table 1: Progression Rates for Math-025 Completers: Fall 2005, 2006 and 2007.

Math-026 (Arithmetic- Computer Assisted): There was not a clear pattern with the progression rates observed for Math-026 which might be a reflection of the low sample sizes; however, the percentage of students whose highest level achieved was Math-026 ranged from 31 to 55 percent (see Table 2). With the exception of the Fall 2005 cohort, the highest level achieved for students who started in Math-026 was Math-058 and Math-059.

Math 026	Math 026 Completers (N)	Math 026	Math 058	Math 059	Math 060	Math 070	Transfer STEM Path	Transfer Non STEM Path
Fall 2005	45	44%	11%	11%	13%	13%	*	*
Fall 2006	26	31%	*	23%	*	*	*	*
Fall 2007	31	55%	16%	*	*	--	*	*
Average		43%	13%	17%	13%	13%	*	*

Table 2: Progression Rates for Math-026 Completers: Fall 2005, 2006 and 2007.

Math-058 (Algebra Preparation): Of the students who started in Math-058 and successfully completed the course, Math-058 was the highest level achieved for **40 to 48 percent** of the students who started at this level. On average, Math-058 was the highest level achieved for **45 percent** of the students. Math-060 (Elementary Algebra) was the highest level achieved for **23 and 28 percent** of students in the cohorts. On average, Math-060 was the highest level achieved for **26 percent** of the students.

On average, **19 percent** of the students progressed to *degree applicable* math (Math-070/083). Students whose entry point was Math-058 were approximately **twice** as likely to progress to *degree applicable math* (Math-070/083) compared to those who entered in Math-025 (Arithmetic).

On average, **nine percent** of students progressed to *transfer level* math courses (Math-102 and higher). Specifically, **3 percent** progressed to a math course in the *STEM path* and **6 percent** progressed to a math course in the *Non-STEM path*.

Math 058	Math 058 Completers (N)	Math 058	Math 060	Math 070	Math 083	Transfer STEM Path	Transfer Non STEM Path
Fall 2005	220	47%	23%	22%	*	4%	4%
Fall 2006	223	48%	28%	14%	*	3%	8%
Fall 2007	156	40%	28%	18%	1%	3%	7%
Average		45%	26%	18%	1%	3%	6%

Table 3: Progression Rates for Math-058 Completers:
Fall 2005, 2006 and 2007.

Math-059 (Algebra Preparation- Computer Assisted): There was not a clear pattern with the progression rates observed for Math-059 which might be a reflection of the low sample sizes; however, the percentage of students whose highest level achieved was Math-059 ranged from **17 to 59 percent** (see Table 4). The highest level achieved for **23 to 52 percent** of students was Math-060. In Fall 2005, Math-070 was the highest level achieved for **17 percent** of students. Less than five students in each of the cohorts progressed to transfer level courses as indicated by the asterisks.

Math 059	Math 059 Completers (N)	Math 059	Math 060	Math 070	Math 083	Transfer STEM Path	Transfer Non STEM Path
Fall 2005	35	17%	34%	17%	*	*	*
Fall 2006	22	59%	23%	--	--	*	*
Fall 2007	21	24%	52%	*	--	--	*
Average		33%	36%	17%		*	*

Table 4. Progression Rates for Math 059 Completers: Fall 2005, 2006 and 2007

Math-060 (Elementary Algebra): On average, Math-060 was the highest level achieved for **40 percent** of the students who started at this level and successfully completed the course (see Table 5). Math-070 (Intermediate Algebra) was the highest level achieved for **23** and **33 percent** of the students (average 26%). On average, **28 percent** progressed to *degree applicable math* (Math-070/083). Students whose entry point was Math-060 were nearly **three times** as likely to progress to *degree applicable math* compared to those who started in Math-025 (Arithmetic).

On average, **28 percent** progressed to *transfer level math* courses (Math-102 and higher). Specifically, **13 percent** progressed to a math course in the *STEM path* and **15 percent** progressed to a math course in the *Non-STEM path*. Students whose entry point was Math-060 progressed to a transfer level course at a rate that was **9 percent** higher than those who started the math sequence in Math-058.

Math 060	Math 060 Completers (N)	Math 060	Math 070	Math 083	Transfer STEM Path	Transfer Non STEM Path
Fall 2005	230	44%	23%	*	14%	13%
Fall 2006	206	42%	23%	*	13%	17%
Fall 2007	285	33%	33%	2%	12%	16%
Average		40%	26%	2%	13%	15%

Table 5: Progression Rates for Math-060 Completers: Fall 2005, 2006 and 2007.

*Approximate due to limitations with Cal-PASS results not showing actual numbers for individual courses with less than 5 students in the progression analysis.

Math-063/083 (Geometry): Please refer to Appendix A for details. Due to low sample sizes, meaningful conclusions cannot be drawn for this course.

Math-070 (Intermediate Algebra): Math-070 was the highest level achieved for approximately **one-third** of students who started in Math-070 and successfully completed it (see Table 6). On average, **63 percent** progressed to *transfer level math* courses (Math-102 and higher). Specifically, **34 percent** progressed to a math course in the *STEM path* and **27 percent** progressed to a math course in the *Non-STEM path*. Students who started the math sequence in Math-070 and successfully passed the course were **six times** more likely to progress to a transfer level course compared to those who started in Math-058.

Math 070	Math 070 Completers (N)	Math 070	Math 083	Transfer STEM Path	Transfer Non STEM Path
Fall 2005	299	35%	--	33%	32%
Fall 2006	330	32%	2%	38%	27%
Fall 2007	312	32%	5%	32%	31%
Average		33%	3%	34%	27%

Table 6: Progression Rates for Math-070 Completers:
Fall 2005, 2006 and 2007.

*Approximate due to limitations with Cal-PASS results not showing actual numbers for individual courses with less than 5 students in the progression analysis.

Summary of Findings

- **Math-025 (Arithmetic):**
 - On average, Math-025 was the highest level achieved for students starting at this level and who successfully passed the course for **36 percent** of students.
 - On average, Math-058 (Algebra Preparation) was the highest level achieved for **26 percent** of the students.
 - On average, Math-060 (Elementary Algebra) was the highest level achieved for **20 percent** of students who started in Math-025.
 - *Less than 10 percent* of students who started at Math-025 progressed to degree applicable math (Math-070-Intermediate Algebra).
- **Math-026 (Arithmetic- Computer Assisted):**
 - There was not a clear pattern with the progression rates observed for Math-026 which might be a reflection of the low sample sizes; however, the percentage of students whose highest level achieved was Math-026 ranged from 31 to 55 percent. With the exception of the Fall 2005 cohort, the highest level achieved for students who started in Math-026 was Math-058 and Math-059.
- **Math-058 (Algebra Preparation):**
 - On average, Math-058 was the highest level achieved by **45 percent** of the students who started at this level and successfully passed the course.
 - For those who were successful in Math-058, **19 percent** progressed to *degree applicable math* (Math-070/083).
 - Approximately **9 percent** of students progressed to *transfer level math* courses (Math-102 and higher). Specifically, **3 percent** progressed to a math course in the *STEM path* and **6 percent** progressed to a math course in the *Non-STEM path*.
 - Students whose entry point was Math-058 were approximately **twice** as likely to progress to *degree applicable math* (Math-070/083) compared to those who entered in Math-025 (Arithmetic).

- **Math-059 (Algebra Preparation- Computer Assisted):**
 - There was not a clear pattern with the progression rates observed for Math-059 which might be a reflection of the low sample sizes; however, the percentage of students whose highest level achieved was Math-059 ranged from 17 to 59 percent
 - The highest level achieved for 23-52 percent of students was Math-060.
 - In Fall 2005, Math-070 was the highest level achieved for 17 percent of students.
- **Math-060 (Elementary Algebra):**
 - On average, Math-060 was the highest level achieved for **40 percent** of the students.
 - On average, **28 percent** of the students progressed to degree applicable math (Math-070-Intermediate Algebra).
 - On average, **28 percent** of the students progressed to transfer level math (Math-102 and higher). Specifically, **13 percent** progressed to a math course in the *STEM path* and **15 percent** progressed to a math course in the *Non-STEM path*.
 - Students whose entry point was Math-060 were nearly **three times** as likely to progress to *degree applicable math* compared to those who started in Math-025 (Arithmetic) and progressed at a rate that was **9 percent** higher than those who started the math sequence in Math-058.

Math-070 (Intermediate Algebra):

- The highest level achieved for approximately **one-third** of students was Math-070.
- On average, **63 percent** progressed to *transfer level math* courses (Math-102 and higher). Specifically, **34 percent** progressed to a math course in the *STEM path* and **27 percent** progressed to a math course in the *Non-STEM path*.
- Students who started the math sequence in Math-070 and successfully passed the course were **six times** more likely to progress to a transfer level course compared to those who started in Math-058.

Recommendations

Upon review of the results, the following recommendations should be taken into consideration for the College:

- Explore ways to increase the progression rate through the math course sequences, especially for students beginning at Math-025/026 and Math-058/059.

Appendix A

Math-063/083 (Geometry): A little less than half of students did not progress past Math-063/083 during the Fall 2005 semester (**46 percent**). During the Fall 2006 semester, just over a third progressed to *degree applicable math* (Math-070/083) (**33 percent**).

Math 063/083	Total (N)	Cohort (N)	Math 063	Math 070	Math 102	Math 103	Math 104	Math 130	Math 140	Math 211
Fall 2005	57	24	46%	*	*	*	*	*	*	*
Fall 2006	70	15	40%	33%	*	--	*	*	*	*
Fall 2007	--	--	--	--	--	--	--	--	--	--

Table 1: Progression Rates for Math-063 Cohorts: Fall 2005, 2006 and 2007.