

College Algebra Cut Score Analysis

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Office of Planning and Institutional Research



Executive Summary

An analysis was conducted to examine students' performance in MATH 1513 (College Algebra) as a function of ACT Math scores ranging from 19 to 21. Specifically, the sample consisted of 2,140 TCC students who enrolled in College Algebra for the first time during the 07-08, 08-09, and 09-10 academic years and placed into the course with an ACT Math score of 19, 20, or 21. To ensure that the sample consisted of only students who were placed into College Algebra based on their ACT Math score, the sample excluded any students who had completed MATH 0123 (Intermediate Algebra) with a C or better, those without an ACT Math score, and students who were "coursed in" based on prior coursework. A total of 863 (40.3%) of the sample earned a score of 19 on the ACT Math test, 672 (31.4%) had a score of 20, and 605 (28.3%) earned a 21 on the exam.

All statistical analyses were conducted using a 95% confidence level. The primary analysis involved a chi-square test to determine whether there were any significant differences in the rates of earning a C or better among students with a 19, 20, and 21 on the ACT Math test. Results revealed a statistically significant chi-square statistic, indicating that the rates of earning a C or better varied across the students with different ACT scores, $\chi^2 = 13.11$, $p = .001$. Follow-up tests revealed that the group with a 19 on the ACT Math had a significantly lower rate of earning a C or better in College Algebra than those with a 20 or 21 on the ACT Math test (see Figure 1 and Table 1 below).

Figure 1. Percentage of Students Earning a C or Better in College Algebra by ACT Math Score

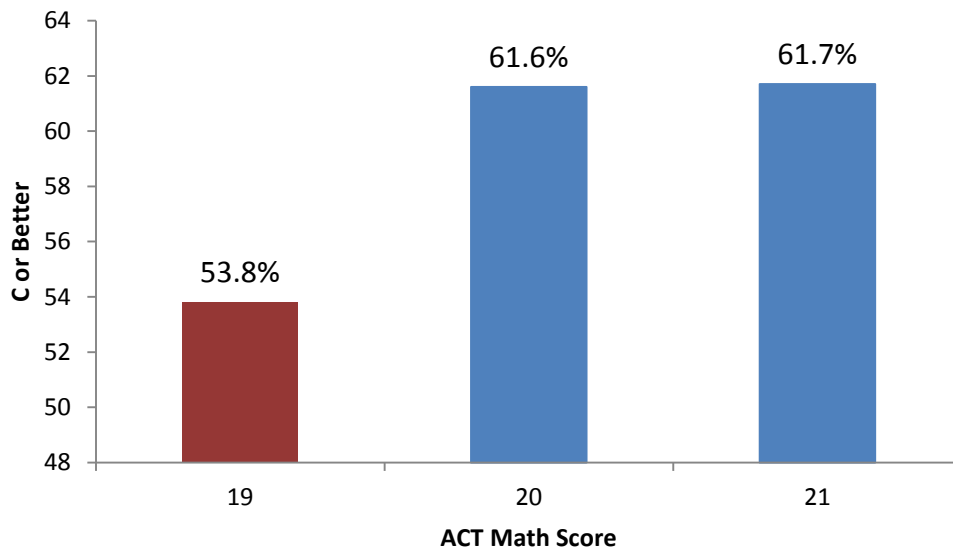
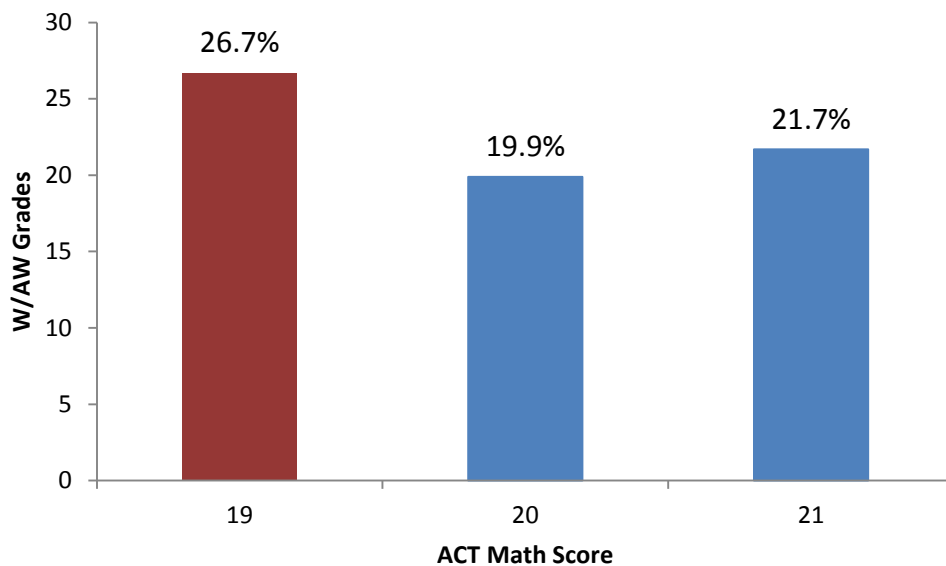


Table 1. College Algebra Grade Distributions by ACT Math Scores

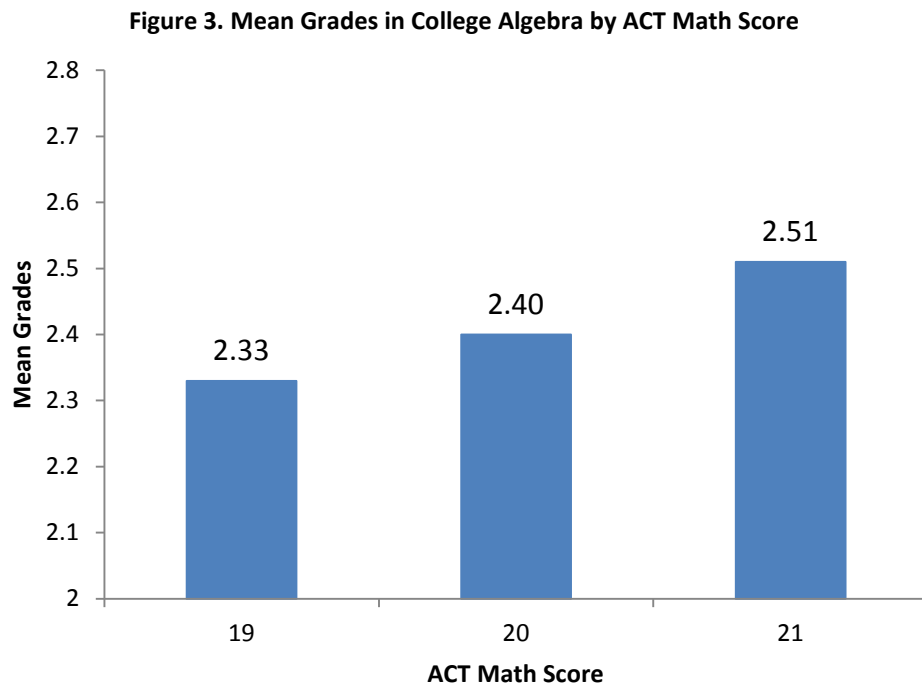
Final Grade	ACT Math = 19		ACT Math = 20		ACT Math = 21	
	Number	Percent	Number	Percent	Number	Percent
A	138	16.0%	132	19.6%	119	19.7%
B	187	21.7%	150	22.3%	155	25.6%
C	139	16.1%	132	19.6%	99	16.4%
C or Better	464	53.8%	414	61.6%	373	61.7%
D	86	10.0%	49	7.3%	51	8.4%
F	83	9.6%	75	11.2%	50	8.3%
W/AW	230	26.7%	134	19.9%	131	21.7%
Total	863	100%	672	100%	605	100%

Interestingly, when examining the rates of C or better but excluding students who earned a W or AW (i.e., including only those who got an A, B, C, D, or F), there was no significant difference between the three groups, $\chi^2 = 4.68, p = .096$. This finding likely reflects the significantly higher rate of W/AW grades among students with a 19 on the ACT Math than those with a 20 or 21, $\chi^2 = 10.61, p = .005$ (see Figure 2 below).

Figure 2. Percentage of Students Earning a W/AW in College Algebra by ACT Math Score



In addition to exploring rates of C or better, an analysis was conducted using letter grades converted to a 0-4 GPA scale, such that A = 4, B = 3, C = 2, D = 1, and F = 0. To examine mean differences on the 0-4 grade scale, an analysis of variance (ANOVA) was conducted with ACT Math score as the independent variable. Results showed that the effect of ACT Math scores on grades was not statistically significant, $F(2, 1642) = 2.52, p = .081$ (see means in Figure 3 below).



In conclusion, findings indicate that students placing into College Algebra with an ACT Math score of 19 had a significantly lower rate of success in the course than did those earning a 20 or 21 on the ACT Math test. This difference seems to be largely due to the significantly higher rate of W and AW grades among students with 19 on the ACT test, as the differences in success rates disappeared when examining only students earning grades of A, B, C, D, or F. Consistent with this finding, no significant differences were found on mean grades in the course (converted to a 0-4 scale), when excluding students with a W or AW.