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Article

Examining the Influence of Study Habits, Self - Efficacy and First Quarter Performance on Mathematics Test Scores Using Linear Regression Analysis

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Abstract: This study determined the relationship between study habits, self-efficacy, and first-quarter performance and their influence on the mathematics test scores of Grade 10 students on polynomial functions. Using a quantitative-correlational research design, data were collected from 26 Grade 10 students at the Laboratory High School of Jose Rizal Memorial State University–Katipunan during the Academic Year 2025–2026. Study habits and self-efficacy were measured using survey questionnaires, first-quarter performance was obtained from official academic records, and a researcher-made mathematics test assessed students' achievement in polynomial functions. Data were analyzed using descriptive statistics, Pearson correlation, multiple linear regression, and binomial logistic regression at a 0.05 level of significance. Results showed that students generally exhibited satisfactory study habits and moderate self-efficacy, and their first-quarter performance was rated very satisfactory. However, mathematics test scores on polynomial functions were generally low, with most students failing to meet expectations. Correlation analyses revealed that study habits and first-quarter performance were not significantly related to mathematics test scores, while self-efficacy showed a moderate and significant positive relationship with performance. Multiple linear regression results indicated that the combined predictors significantly explained mathematics test scores, with self-efficacy emerging as the only significant predictor. In contrast, binomial logistic regression revealed that study habits, self-efficacy, and first-quarter performance did not significantly predict students' likelihood of passing or failing the mathematics test. The findings suggest that while general study habits and prior academic performance are important, students' confidence in their mathematical abilities plays a more critical role in achievement in polynomial functions. The study underscores the need for instructional strategies that enhance self-efficacy, strengthen conceptual understanding, and provide targeted remediation in mathematics.

Keywords: study habits, self-efficacy, first-quarter performance, polynomial functions, mathematics test scores

1. INTRODUCTION

Mathematics plays a crucial role in developing logical thinking, problem-solving, and analytical skills. It serves as the foundation for numerous disciplines and is essential for enhancing students' reasoning abilities and intellectual competence. Moreover, mathematics reflects a natural human thought process necessary for analyzing everyday situations, as well as scientific and technological phenomena. Despite its importance, many students perceive mathematics as a difficult subject due to its abstract nature and the significant time required to fully comprehend its concepts. Inadequate dedication to studying mathematics can hinder understanding and lead to poor academic performance.

Research suggests that effective learning behaviors can significantly influence academic outcomes. According to Credé and Kuncel (2008), study habits, skills, and attitudes constitute a critical "third pillar" of college-level academic success, often surpassing the predictive power of standardized assessments and prior academic achievement. Supporting this, Elango and Manimozhi (2021) conducted a meta-analysis of thirty studies and found a moderately strong positive correlation (r = 0.519) between effective study practices and academic performance. These findings

highlight that students' intentional learning behaviors, such as structured study routines and focused engagement, play a substantial role in improving achievement.

Another important determinant of mathematics performance is self-efficacy, or students' belief in their ability to succeed in specific tasks. Using U.S. National Assessment of Educational Progress (NAEP) 2019 data for Grades 4, 8, and 12, Yang et al. (2024) found that mathematics self-efficacy (MSE) was a robust predictor of achievement across both student and school levels. Controlling for MSE reduced achievement gaps among subgroups, including ELL, IEP, and NSLP students, although gender and ethnicity gaps were not fully eliminated. Similarly, Jameson et al. (2022) reported that math-specific self-efficacy fully mediated the negative impact of math anxiety on performance, indicating that higher self-efficacy can mitigate anxiety-related challenges. These studies underscore the central role of self-efficacy in shaping students' mathematics achievement.

Previous performance also provides insight into current mathematics outcomes. Abalde and Oco (2023) found a positive association between students' study habits, particularly attitudes toward learning, and their first quarter mathematics performance. However, they reported no significant correlation between study habits related to self-confidence and performance. Moreover, Purnaningtyas and Safa'atullah (2023) observed that students with higher self-efficacy were more likely to achieve mastery in mathematical literacy through Problem-Based Learning (PBL) combined with the PMRI approach, while lower self-efficacy corresponded to partial or minimal achievement across specific indicators. These findings suggest that prior performance, when combined with study habits and self-efficacy, can provide a predictive understanding of future mathematics outcomes.

While these studies demonstrate the influence of study habits, self-efficacy, and previous performance on mathematics achievement, gaps remain in the literature. Specifically, no studies have examined the combined effect of these variables on mathematics test scores in localized educational contexts, such as Philippine secondary schools. Additionally, there is limited research addressing how second quarter or previous quarter performance interacts with self-efficacy and study habits to predict current test outcomes. This gap underscores the need for research that integrates these variables to provide a more comprehensive understanding of factors influencing mathematics achievement.

Therefore, this study aimed to determine the relationship between study habits, self-efficacy, and first quarter performance on mathematics test scores. The findings may offer valuable insights for educators, students, and policymakers in developing strategies and interventions that enhance mathematics learning outcomes and foster more effective study practices.

Statement of the Problem

This study aimed to determine the relationship between the study habits, self-efficacy, and first quarter performance and their test scores on polynomial functions.

Specifically, it sought to answer the following:

1. What is the profile of the respondents in terms of:
   - 1.1 Sex, and
   - 1.2 Age?
2. What is the level of study habits of Grade 10 students?
3. What is the level of self-efficacy of Grade 10 students?
4. What is the level of first quarter performance of Grade 10 students?
5. What is the mathematics test scores of Grade 10 students on polynomial functions?
6. Is there a significant relationship between the level of study habits and the mathematics test scores of Grade 10 students on polynomial functions?
7. Is there a significant relationship between the level of self-efficacy and mathematics test scores of Grade 10 students on polynomial functions?
8. Is there a significant relationship between the level of first quarter performance and mathematics test scores of Grade 10 students on polynomial functions?

9. Is there a significant relationship between the level of study habits, self-efficacy, and first quarter performance and mathematics test scores of Grade 10 students on polynomial functions?

10. Is there a significant effect of the level of study habits, self-efficacy, and first quarter performance, on the likelihood of students obtaining pass or fail scores in mathematics tests of Grade 10 students on polynomial functions?

2. RELATED LITERATURE

2.1 Study Habits and Mathematics Test Scores

Several studies have consistently highlighted the influence of study habits on students' mathematics performance across different educational levels. Etcuban et al. (2019) reported a weak but positive relationship between students' attitudes including study habits and mathematics achievement, suggesting that study habits, while not the sole predictor, remain an important contributing factor. Similarly, Corpuz (2024) found positive trends linking stronger study habits with improved mathematics performance among Grade 7 students, even though the primary focus of the study was on 21st-century learning skills. These findings indicate that developing effective study habits can enhance students' ability to perform well in mathematics across diverse contexts.

At the tertiary and specialized education levels, the importance of study habits is further reinforced. Cuizon et al. (2022) demonstrated that study habits were significantly associated with mathematics performance among freshmen college students during the COVID-19 pandemic, complementing students' preferred learning styles. Travero et al. (2025) observed a moderate positive relationship between study habits and mathematics performance among agriculture students under new normal learning conditions, with female students outperforming their male counterparts. Abalde and Oco (2023) also emphasized that study habits and learning techniques are key determinants of mathematics achievement, showing that strong study habits are closely linked to positive attitudes and better academic outcomes.

Structural and descriptive analyses further illustrate the predictive role of study habits on mathematics performance. Falebita et al. (2025), using structural equation modeling, confirmed that mathematics study habits significantly predicted academic achievement and were positively associated with students' academic attitudes, highlighting their dual impact on both performance and mindset. Conversely, a descriptive study of Grade 7 students revealed that poor study habits were associated with lower mathematics performance, emphasizing the need for targeted interventions to improve study behaviors (2016). Collectively, these studies affirm that study habits, although varying in strength of impact, remain a crucial factor influencing mathematics test scores across different educational contexts.

2.2 Self-Efficacy and Mathematics Test Scores

Several empirical studies have established a strong link between self-efficacy and mathematics achievement across different educational levels. Asoy and Picaza (2025) found that self-efficacy had a strong positive correlation with mathematics achievement among first-year education students, with both self-efficacy and persistence significantly influencing mathematics performance. Similarly, Campanilla (2025) reported that mathematics self-efficacy significantly predicted the academic performance of Grade 8 learners, indicating that students who believed in their mathematical capabilities tended to achieve higher mathematics test scores. These findings emphasize that students' confidence in their ability to succeed in mathematics plays a crucial role in their academic outcomes.

Supporting evidence from large-scale and review studies further reinforces the importance of self-efficacy in mathematics learning. Roslan and Maat (2024), through a systematic literature review, concluded that higher levels of mathematics self-efficacy among secondary students were consistently associated with better mathematics performance. Using large-scale NAEP data, Yang, Maeda, and Gentry (2024) demonstrated that mathematics self-efficacy accounted for a substantial portion of the variance in mathematics achievement, particularly among Grade 8 students. In addition, Zuo et al. (2025) found that mathematics self-efficacy positively predicted achievement among sixth-grade students, while math anxiety negatively affected performance, with both variables mediating the relationship between math self-concept and achievement. Collectively, these studies highlight self-efficacy as a significant psychological factor influencing mathematics test scores across various age groups and learning contexts.

2.3 First Quarter Performance and Mathematics Test Scores

Early academic performance has been consistently identified as a strong predictor of later mathematics achievement. Duncan et al. (2007) found that early mathematics achievement is one of the strongest indicators of future academic success, even after controlling for cognitive ability and socio-economic factors. Students who performed well during initial academic periods tended to obtain higher mathematics test scores in subsequent assessments, underscoring the importance of early performance indicators such as first-quarter grades. Similarly, Sirin (2005), in a comprehensive meta-analysis, emphasized that prior academic performance is among the most powerful predictors of future academic outcomes, including mathematics achievement. Early-term performance reflects students' foundational knowledge and learning behaviors that tend to persist across grading periods.

In addition, early academic performance serves as a critical indicator of students' long-term engagement and learning processes in mathematics. Balfanz, Herzog, and Mac Iver (2007) demonstrated that first grading period results are strong predictors of later academic success and standardized mathematics test performance, with low early performance increasing the risk of sustained underachievement. Complementing these findings, Zimmerman and Kitsantas (2014) reported that early mathematics performance is closely associated with students' self-regulation skills, such as planning, monitoring, and evaluating learning strategies. These self-regulatory abilities, reflected in first-quarter performance, significantly influence subsequent mathematics test scores, highlighting the role of early achievement as both a predictor and a reflection of effective learning behaviors.

3. METHODOLOGY

3.1 Research Design

This study employed a quantitative–correlational research design to examine the relationship between study habits, self-efficacy, first quarter performance, and mathematics performance. This design was appropriate because it allowed the researcher to determine the degree of association among variables and assess their predictive influence on students' mathematics test scores. Multiple linear regression and binomial logistic regression analyses were used to determine the predictive power of the identified variables on mathematics performance.

3.2 Research Instrument

The instruments used in the study were adopted from previously developed and validated questionnaires. The Study Habits questionnaire was adopted from Egbujuo and Ajagun (2019), while the Self-Efficacy measure was adopted from the Generalized Self-Efficacy Scale developed by Schwarzer and Jerusalem (1995). The use of these established instruments supports the reliability and validity of the measures employed in the study. For the level of Grade 10 students' first-quarter performance, official mathematics grades were obtained from their Mathematics teacher. Meanwhile, the test questionnaire on polynomial functions was developed and subjected to content validation by Mathematics professors. Their comments and suggestions were incorporated prior to administration. The revised test was then pilot-tested among students who were not part of the actual respondents of the study. To further establish reliability, the pilot test data were analyzed using Cronbach's Alpha to measure internal consistency of each subscale, with coefficients meeting the acceptable reliability threshold of 0.70 and above.

3.3 Participants

The respondents of the study were the Grade 10 students at the Laboratory High School of Jose Rizal Memorial State University–Katipunan during Academic Year 2025–2026. A total sample of twenty-six (26) students were included, selected through purposive sampling. Participation was voluntary, and only those students with available information on study habits, self-efficacy, and first quarter mathematics performance will be considered.

3.4 Scoring Procedure

To measure students' level of study habit, the following mean ranges with the corresponding verbal description and interpretation was used.

Mean Range	Numerical Scale	Verbal Description	Interpretation
3.26 – 4.00	4	Always	Always. This is a rating given to the statement where students consistently and regularly performs the specified study habit as part of their normal learning routine.
2.51 – 3.25	3	Most Times	Most Times.

			This is a rating given to the statement where students frequently performs the specified study habit but not in all instances.
1.75 – 2.50	2	Sometimes	Sometimes. This is a rating given to the statement where students occasionally performs the specified study habit.
1.00 – 1.75	1	Never	Never. This is a rating given to the statement where students does not perform the specified study habit.

To determine the students' level of self-efficacy, the following mean ranges with the corresponding verbal description and interpretation was used.

Mean Range	Numerical Scale	Verbal Description	Interpretation
3.26 – 4.00	4	Exactly True	High Self-Efficacy. This is a rating given to the statement which shows strong and consistent confidence in students' ability to complete mathematics tasks successfully, even when they are difficult.
2.51 – 3.25	3	Moderately True	Moderate Self-Efficacy. This is a rating given to the statement which shows a fair level of confidence in completing mathematics tasks but may experience some uncertainty with more complex or unfamiliar problems.
1.75 – 2.50	2	Hardly True	Low Self-Efficacy This is a rating given to the statement which demonstrates limited confidence in students' ability to perform mathematics tasks.
1.00 – 1.75	1	Not At All True	Very Low Self-Efficacy. This is a rating given to the statement which shows little to no confidence in completing mathematics tasks.

3.5 Data Gathering Procedure

Permission to conduct the study was obtained from the appropriate school authorities. Upon approval, the selected students were invited to participate and provided their consent before data collection. The respondents answered a survey questionnaire designed to assess their study habits and self-efficacy. Their first quarter mathematics performance was obtained from their respective mathematics teacher. After the completion of the discussion on polynomial functions, a mathematics test was administered to measure their current level of achievement. The test scores were matched with the data on study habits, self-efficacy, and first quarter performance to determine possible relationships among the variables. All gathered data were carefully encoded, organized, and subjected to statistical analysis.

4. DATA ANALYSIS

Frequency count and Percentage, Mean, Pearson Correlation, Multiple Linear Regression, and Binomial Logistic Regression were the statistical tools used in this study.

1. **Frequency Count and Percentage**. This was used in profiling the respondents in terms of sex and gender.

2. **Mean.** This was used to determine the level of study habit of the Grade 10 students. This will be used to determine the level of self-efficacy of Grade 10 students. Mean was also used to determine the first quarter performance of Grade 10 students and the level of mathematics test scores of Grade 10 students.

3. **Pearson correlation**. This was used to determine the significant relationship between the level of study habit and mathematics test scores of Grade 10 students on polynomial functions. This was used to determine the significant relationship between the level of self-efficacy and mathematics test scores of Grade

10 students on polynomial functions. Pearson correlation was also used to determine the level of first quarter performance and mathematics test scores of Grade 10 students on polynomial functions.

4. **Multiple linear regression**. It was used to examine the combined effect of study habits, self-efficacy, and first quarter performance on mathematics test scores of Grade 10 students on polynomial functions, and to identify which factor significantly predicts performance. The adjusted R^2 was reported to measure the variance explained.

5. **Binomial logistic regression.** It was used to assess whether the study habits, self-efficacy, and first quarter performance significantly affects the likelihood of students obtaining pass or fail mathematics test scores of Grade 10 students on polynomial functions. Odds ratios, confidence intervals, and model fit indices (e.g., Nagelkerke R^2, Hosmer–Lemeshow test) were reported to evaluate the model.

A significance level of **0.05** was used as the basis for decision-making in all statistical tests. Data analysis was carried out using (state software, e.g., SPSS, JAMOVI, JASP or Minitab)

4.1 Ethical Considerations

Informed consent was obtained from all participants, ensuring voluntary participation and confidentiality under the Data Privacy Act (RA 10173). Data were securely stored in the researchers' Google Drive and scheduled for deletion six months after publication or presentation.

5. RESULTS AND DISCUSSION

Table 1 presents the profile of the respondents in terms of sex. As seen in the table, majority of the respondents are male. The results indicate that male respondents slightly outnumber female respondents in the study. Although the difference is not very large, it suggests a moderate predominance of males among the participants.

Table 1: The profile the respondents in terms of sex

Sex	Frequency(f)	Percentage (%)
Male	15	57.69
Female	11	42.31
Total	**26**	**100.00**

Table 2 presents the profile of the respondents in terms of age. As seen in the table, majority of the respondents are 15 years old. Meanwhile, only 5 respondents (19.23%) are 16 years old. This indicates that the respondents are predominantly within a narrow age range, with most belonging to the 15-year-old group. The concentration of respondents at age 15 suggests that the sample is relatively homogeneous in terms of age. This homogeneity may be attributed to the respondents being in the same grade level or academic cohort, where age differences are minimal.

Table 2: The profile the respondents in terms of age

Age	Frequency(f)	Percentage (%)
15	21	80.77
16	5	19.23
Total	**26**	**100.00**

Table 3 shows that the overall level of study habits of Grade 10 students in terms of homework and assignments is interpreted as "Most Times" with a mean of 2.84, indicating that students generally demonstrate acceptable study behaviors related to academic tasks. The results reveal that students most often make up missed lessons when absent and persist in completing assignments even when they are dull, while they almost always submit their assignments on time, reflecting responsibility and task commitment. However, some less desirable practices were observed, as students only sometimes begin assignments immediately and tend to focus on easier parts when tasks are long or difficult, suggesting procrastination and avoidance of challenging work. This implies that while Grade 10 students generally demonstrate positive homework and assignment study habits, these behaviors are not consistently strong enough to fully maximize mathematics performance. The tendency to submit tasks on time and complete assignments

despite boredom suggests that students possess a basic level of responsibility that can positively contribute to mathematics test scores.

Table 3: The level of study habits of Grade 10 students in terms of homework and assignment

Descriptors	Average Weighted Value(AWV)	Interpretation
When your assigned homework is too long or unusually hard, do you either stop or study only the easier parts of the lesson?	2.50	Sometimes
If you have to be absent from class, do you make up missed lessons and notes immediately?	3.04	Most Times
Even though an assignment is dull and boring do you stick to it until it is completed	3.04	Most Times
Do you put off doing written assignments until the last minute?	2.73	Most Times
Do you complete and submit your assignments on time?	3.27	Almost
Do you begin your assignment as soon as the teacher gives them to you and not allow them to pile up?	2.46	Sometimes
Mean	**2.84**	**Most Times**

The results show that the level of study habits of Grade 10 students in terms of time management is interpreted as "Sometimes" with a mean of 2.28, indicating generally weak and inconsistent time-management practices. Students most times experience difficulty keeping up with schoolwork due to having many other activities and unevenly distributing their time across subjects, suggesting challenges in prioritization and planning. Moreover, students only sometimes allocate sufficient study time after classes and are occasionally distracted by leisure activities and external problems, which may negatively affect sustained academic engagement. This implies that poor time-management skills may limit the effectiveness of students' study habits, thereby weakening their potential mathematics test performance.

Table 4: The level of study habits of Grade 10 students in terms of time allocation

Descriptors	Average Weighted Value(AWV)	Interpretation
Do you spend too much time talking or listening to the radio for the good of your study?	2.19	Sometimes
Do you find that having many other things to do causes you to get behind in your school work?	2.73	Most Times
Do problems outside of the classroom – with other students or at home – cause you to neglect your school work?	1.92	Sometimes
Do you study for at least three hours each day after classes?	2.04	Sometimes
Is your time unevenly distributed: do you spend too much time on some subjects and not enough on others?	2.54	Most Times
Do you spend too much time reading fiction (Novels), going out, etc. for the good of your school work?	2.23	Sometimes

Mean	**2.28**	**Sometimes**

Table 5 presents the level of study habits of Grade 10 students in terms of reading and note taking. The results indicate that the level of study habits of Grade 10 students in terms of reading and note-taking is interpreted as "Most Times" with a mean of 2.95, suggesting that students frequently engage in reading and note-taking behaviors, though not always effectively. Many students most times experience difficulty identifying important points, retaining what they have read, and distinguishing essential from unimportant information, which leads to repeated rereading and note-taking of less relevant details. At the same time, students almost always recite or review material after studying and pronounce words while reading, indicating effort to enhance comprehension and recall. This implies that while students show persistence and active engagement in reading and note-taking, inefficiencies in comprehension and information selection may reduce the effectiveness of these study habits.

Table 5: The level of study habits of Grade 10 students in terms of reading and note taking

Descriptors	**Average Weighted Value(AWV)**	**Interpretation**
In taking notes, do you tend to write down things which later turn out to be unimportant?	3.15	Most Times
After reading several pages of an assignment, do you find yourself unable to remember what you have just read?	2.73	Most Times
Do you find it hard to pick out the unimportant points of a reading assignment?	2.62	Most Times
When reading a long assignment, do you stop now and then to try to remember what you have read?	2.85	Most Times
Do you have to reread materials several times because the words don't have much meaning the first time you go over them?	3.08	Most Times
Do have trouble picking out the important points in the material read or studied	2.58	Most Times
Do you go back and recite to yourself the material you have studied, rechecking any point you find doubtful?	3.27	Almost
Do you miss important points in the lecture while copying down notes on something which have?	2.88	Most Times
Do you pronounce words to yourself as you read?	3.38	Almost
Mean	**2.95**	**Most Times**

The results indicate that the level of study habits of Grade 10 students in terms of study period procedures is interpreted as "Most Times" with a mean of 2.81, suggesting that students generally follow structured study routines, though not always optimally. Students most times keep their notes organized, plan their study sessions, and persist in studying despite feeling tired or bored, while they almost always prefer studying alone, indicating independence and focus. However, some challenges are evident, such as restlessness, difficulty staying focused for long periods, and low efficiency in accomplishing tasks relative to the time spent studying. These findings suggest that while students demonstrate an overall commitment to structured study, factors like fatigue, boredom, and inefficiency may limit the effectiveness of their study periods. This implies that improving time management, concentration, and study environment could enhance students' study efficiency, thereby positively influencing mathematics performance.

Table 6: The level of study habits of Grade 10 students in terms of study period procedure

Descriptors	Average Weighted Value(AWV)	Interpretation
1. Do you keep all your notes for subject together and carefully arranged for studying?	3.08	Most Times
2. Do you need a long time to get warmed up when you want to start studying?	2.73	Most Times
3. Are you unable to study well because you get restless and unable to sit for long?	2.62	Most Times
4. When you sit down to study, do you find yourself too tired, bored or sleepy to study well?	3.04	Most Times
5. Do you prefer to study your lessons alone rather than with others?	3.38	Almost
6. Do you seem to get very little done far the amount of time you spend studying?	2.81	Most Times
7. At the beginning of a study period, do you plan your work so that you will make the best use of your time?	2.81	Most Times
8. Do you find yourself beset by too many health problems to study efficiently?	2.04	Sometimes
Mean	**2.81**	**Most Times**

The results show that the level of study habits of Grade 10 students in terms of concentration is interpreted as "Most Times" with a mean of 3.18, indicating that students generally experience challenges in maintaining focus during study sessions. While students almost always report being distracted by daydreaming and outside interruptions, they most times struggle to keep their minds fully engaged with their lessons for extended periods. This suggests that although students make efforts to study, external and internal distractions frequently limit their concentration, potentially reducing the effectiveness of their study time. The implication of these findings is that difficulties in maintaining concentration may negatively affect mathematics learning and test performance, as sustained focus is critical for understanding and solving mathematical problems.

Table 7: The level of study habits of Grade 10 students in terms of concentration

Descriptors	Average Weighted Value(AWV)	Interpretation
1. Do you find that day dreaming distracts your attention from your lessons while studying?	3.31	Almost
2. Do you find it hard to keep your mind on what you are studying for any length of time?	2.81	Most Times
3. Do outside interruptions disturb you while studying?	3.42	Almost
Mean	**3.18**	**Most Times**

The results indicate that the level of study habits of Grade 10 students in terms of written work is interpreted as "Sometimes" with a mean of 2.27, suggesting that students' engagement in improving and managing their written tasks is generally inconsistent. While students most times experience difficulty expressing their ideas clearly on tests

and essays, they only sometimes correct errors on returned papers or pay attention to neatness, and teachers rarely criticize their work for being poorly planned. This pattern indicates a moderate level of attention to written work, but also reveals gaps in developing effective writing practices that support learning. This implies that inconsistent habits in written work may hinder students' ability to fully demonstrate understanding, including in mathematics, where clarity in showing solutions and reasoning is essential.

Table 8: The level of study habits of Grade 10 students in terms of written work

Descriptors	Average Weighted Value(AWV)	Interpretation
1. Do you correct errors on the papers which your teachers have marked and returned to you?	2.31	Sometimes
2. Do you have trouble saying what you want to say on tests, essays and other written work?	2.69	Most Times
3. Do your teachers criticize your written work for being poorly planned or hurriedly written?	1.62	Never
4. Do you give special attention to neatness on essays, reports and other written work?	2.46	Sometimes
Mean	**2.27**	**Sometimes**

The results indicate that the level of study habits of Grade 10 students in terms of examination is interpreted as "Sometimes" with a mean of 2.45, suggesting that students' preparation and performance during tests are moderately effective but inconsistent. While students most times plan and organize facts before a test, finish their exams on time, and sometimes experience lowered marks due to careless mistakes or nervousness, other issues such as difficulty thinking clearly under time pressure, carelessness in spelling and grammar, and occasional inability to complete tests indicate gaps in effective test-taking strategies. This implies that inconsistent examination habits may negatively impact mathematics test scores, as proper preparation, time management, and careful execution are critical for accurately solving problems under timed conditions.

Table 9: The level of study habits of Grade 10 students in terms of examination

Descriptors	Average Weighted Value(AWV)	Interpretation
1. Do you do poorly on tests because you find it hard to think clearly and plan your work within a short period of time?	2.27	Sometimes
2. Do you get nervous and confused when taking a test and therefore fail to answer questions as well as you otherwise	2.58	Most Times
3. When getting ready for a test, do you arrange facts to be learned in some planned order?	2.73	Most Times
4. Are you careless about spelling, punctuation and grammar when answering test questions?	2.08	Sometimes
5. Are you unable to finish tests within the time allowed although you work until the very last minute?	1.88	Sometimes
6. When tests are returned, do you find that your mark has been lowered by careless mistakes?	2.58	Most Times

7. Do you finish your examination papers and turn them in before time on the examination?	3.04	Most Times
Mean	**2.45**	**Sometimes**

Table 10 presents the level of study habits of Grade 10 students in terms of teacher consultation. The results indicate that the level of study habits of Grade 10 students in terms of teacher consultation is interpreted as "Sometimes" with a mean of 2.46, suggesting that students only occasionally seek guidance from their teachers when encountering difficulties in their studies. While students most times hesitate to ask for clarification on unclear points, they only sometimes make an effort to discuss challenging topics with their teachers. This reflects a tendency toward limited utilization of available academic support, which may hinder the full development of understanding and mastery of subject matter. The implication of these findings is that infrequent teacher consultation may negatively affect students' mathematics performance, as timely guidance and clarification are crucial for addressing misunderstandings and reinforcing learning.

Table 10: The level of study habits of Grade 10 students in terms of teacher consultation

Descriptors	Average Weighted Value(AWV)	Interpretation
1. When you are having trouble with a particular subject, do you try to talk it over with the teacher?	2.12	Sometimes
2. Do you hesitate to ask a teacher for further explanation on a point that is not clear to you?	2.81	Most Times
Mean	**2.46**	**Sometimes**

Table 11 presents the level of self-efficacy of Grade 10 students. The overall mean Average Weighted Value of 2.73 corresponds to the verbal interpretation indicating moderate self-efficacy among the students. This suggests that learners generally believe they can solve problems, achieving goals, and handling challenges, but their confidence is not consistently strong across all situations. Most indicators were rated within the moderate range, particularly those related to effort-based problem solving, coping, and generating solutions, which implies that students tend to believe they can succeed when they exert sufficient effort. However, two items dealing efficiently with unexpected events and overcoming opposition were interpreted as Low Self-Efficacy, indicating specific areas where students experience greater uncertainty or self-doubt. Overall, the findings show that while students possess a workable level of confidence in their abilities, this belief may fluctuate depending on the situation and task demands. Such a moderate level of self-efficacy suggests that students may demonstrate persistence and engagement in mathematics tasks, but their performance may still be affected when problems become unfamiliar or complex.

Table 11: The level of self-efficacy of Grade 10 students

Descriptors	Average Weighted Value(AWV)	Interpretation
I can always manage to solve difficult problems if I try hard enough.	2.85	Moderate Self-Efficacy
If someone opposes me, I can find the means and ways to get what I want.	2.38	Low Self- Efficacy
It is easy for me to stick to my aims and accomplish my goals.	2.72	Moderate Self-Efficacy
I am confident that I could deal efficiently with unexpected events.	2.38	Low Self- Efficacy

Thanks to my resourcefulness, I know how to handle unforeseen situations.	2.88	Moderate Self-Efficacy
I can solve most problems if I invest the necessary effort.	3.12	Moderate Self-Efficacy
I can remain calm when facing difficulties because I can rely on my coping abilities.	2.65	Moderate Self-Efficacy
When I am confronted with a problem, I can usually find several solutions.	2.73	Moderate Self-Efficacy
If I am in trouble, I can usually think of a solution.	3.00	Moderate Self-Efficacy
I can usually handle whatever comes my way.	2.62	Moderate Self-Efficacy
Mean	**2.73**	**Moderate Self-Efficacy**

Table 12 presents the of first quarter performance of Grade 10 students. The results reveal that the first quarter academic performance of Grade 10 students is generally high, with the majority (84.62%) attaining grades in the Very Satisfactory range (85–89) and a notable proportion (11.54%) achieving Outstanding performance (90–100). Only one student (3.84%) fell under the Satisfactory category, while none were classified as Fairly Satisfactory or Did Not Meet Expectations, indicating the absence of low academic performers. The overall mean grade of 87, interpreted as Very Satisfactory, suggests that students are effectively meeting the expected learning competencies. This implies that current instructional strategies and academic support systems are effective and should be sustained while providing enrichment for high-performing students and targeted assistance to maintain consistent achievement across all learners.

Table 12: The level of first quarter performance of Grade 10 students

Grade Range	Interpretation	Frequency (f)	Percentage (%)	Mean	Interpretation
90-100	Outstanding	3	11.54	87	Very Satisfactory
85-89	Very Satisfactory	22	84.62		
80-84	Satisfactory	1	3.84		
75-79	Fairly Satisfactory	0	0		
Below 75	Did Not Meet Expectations	0	0		
Total	**26**	**100**			

Table 13 presents the level of mathematics test scores of Grade 10 students on polynomial functions. The results show that the mathematics test scores of Grade 10 students on polynomial functions are generally low, as the majority of learners (18 out of 26 or 69.22%) fell under the Did Not Meet Expectations category (below 75). Only a small number of students achieved higher performance levels, with 7.69% obtaining Outstanding scores, another 7.69% reaching the Very Satisfactory range, and 15.38% classified as Satisfactory, while no students were in the Fairly Satisfactory category. The overall mean score of 64.62, interpreted as Did Not Meet Expectations, indicates that most students have difficulty mastering polynomial functions. These findings imply a need for strengthened instructional strategies, targeted remediation, and enhanced learning support focused on polynomial concepts to improve students' understanding and performance in mathematics.

Table 13: The level of mathematics test scores of Grade 10 students on polynomial functions

Grade Range	Interpretation	Frequency (f)	Percentage (%)	Mean	Interpretation
90-100	Outstanding	2	7.69	64.62	Did Not Meet Expectations
85-89	Very Satisfactory	2	7.69		
80-84	Satisfactory	4	15.38		
Below 75	Did Not Meet Expectations	18	69.22		
Total	**26**	**100**			

Table 14: Pearson Correlation Test of Significant Relationship between the level of study habits and the mathematics test scores of Grade 10 students on polynomial functions

Variable	Pearson r Value	Strength of Relationship	P-Value	Decision	Interpretation
Level of Study Habits and the Mathematics Test Scores	-0.112	Negligible Relationship	0.585	Fail to Reject H0	No Significant Relationship

The Pearson correlation analysis revealed a negligible and non-significant relationship between the level of study habits and the mathematics test scores of Grade 10 students on polynomial functions ($r = -.112$, $p = .585$), indicating that students' study habits were not significantly associated with their mathematics performance. This finding suggests that variations in study habits did not meaningfully influence students' achievement in polynomial functions, and the null hypothesis was therefore not rejected. The weak negative correlation further implies that study habits alone may not be a reliable predictor of mathematics test scores in this context. This result may be attributed to the influence of other factors such as prior mathematical knowledge, teaching strategies, classroom environment, and students' conceptual understanding of polynomial functions.

Table 15: Pearson Correlation Test of Significant Relationship between the level of self-efficacy and mathematics test scores of Grade10 students on polynomial functions

Variable	Pearson r Value	Strength of Relationship	P-Value	Decision	Interpretation
Level of Self-Efficacy and the Mathematics	0.435	Moderate Relationship	0.026	Reject H0	Significant Relationship

Test Scores					

The Pearson correlation analysis showed a moderate positive and statistically significant relationship between the level of self-efficacy and the mathematics test scores of Grade 10 students on polynomial functions ($r = .435$, $p = .026$), leading to the rejection of the null hypothesis. This finding indicates that students with higher levels of self-efficacy tended to achieve higher mathematics test scores, suggesting that confidence in one's ability to learn and solve mathematical problems plays an important role in performance in polynomial functions. The positive direction of the relationship implies that as students' self-efficacy increases, their mathematics achievement also improves. This result highlights self-efficacy as a meaningful predictor of mathematics performance, particularly in conceptually demanding topics such as polynomial functions.

Table 16: Pearson Correlation Test of Significant Relationship between the level of first quarter performance and mathematics test scores of Grade 10 students on polynomial functions

Variable	Pearson r Value	Strength of Relationship	P-Value	Decision	Interpretation
Level of Study Habits and the Mathematics Test Scores	-0.219	Low or Slight Relationship	0.283	Fail to Reject H0	No Significant Relationship

The Pearson correlation analysis indicated a low and non-significant relationship between the level of first-quarter performance and the mathematics test scores of Grade 10 students on polynomial functions ($r = -.219$, $p = .283$), resulting in the failure to reject the null hypothesis. This finding suggests that students' first-quarter academic performance was not significantly associated with their achievement in polynomial functions, indicating that earlier performance did not reliably predict outcomes in this specific mathematics topic. Although the correlation was negative, its weak magnitude implies that the relationship is negligible and may be due to chance. The discrepancy between the generally Very Satisfactory first-quarter ratings and the Did Not Meet Expectations classification in the mathematics test may be explained by differences in assessment structure and grading components, since quarterly grades are typically derived from varied measures such as quizzes, seatwork, projects, participation, and performance tasks that may allow guided work, partial credit, and revisions, thereby raising overall ratings even when conceptual mastery is uneven. In contrast, the polynomial functions test served as a focused, time-bound measure of independent understanding and higher-order problem solving. Variations in teacher-made grading practices, test difficulty level, and scoring standards may have further contributed to the gap. Moreover, possible misalignment between classroom activities and the specific content and cognitive demands of the test, together with the abstract and multi-step nature of polynomial functions, may have made the assessment more challenging than routine classroom tasks, leading to lower test performance despite higher quarterly grades.

Table 17: Multiple Linear Regression Test of Significant Relationship between the level of study habits, self-efficacy, and first quarter performance and mathematics test scores of Grade 10 students on polynomial functions

Predictor Variable	B	SE B	β	t	P-Value	Interpretation
Constant	278.468	158.689		1.755	0.093	No Significant Relationship
Study Habits	-15.233	8.070	-0.369	-1.888	0.072	No Significant Relationship
Self-Efficacy	17.862	6.459	0.510	2.766	0.011	Significant Relationship
First Quarter	-2.554	1.717	-0.279	-1.487	0.151	No Significant Relationship

Performance						

Note. *R2* = 0.324, *Adjusted R2* =0.232, *F*(3, 22)=3.517, *p*= 0.032.

B=unstandardized coefficient;SE B=standard error; β=standardized coefficient

The multiple linear regression analysis showed that the combined predictors study habits, self-efficacy, and first-quarter performance significantly predicted the mathematics test scores of Grade 10 students on polynomial functions, F(3, 22) = 3.517, p = .032, explaining 32.4% of the variance (R^2 = .324, adjusted R^2 =

.232). Among the predictors, only self-efficacy was a significant contributor (β = .510, p = .011), indicating that higher confidence in one's abilities is associated with better performance. Study habits (β = −.369, p

= .072) and first-quarter performance (β = −.279, p = .151) were not significant predictors when other variables were controlled. Although some bivariate correlations were non-significant, regression analysis remains appropriate because it examines the combined and unique predictive effects of theoretically relevant variables. Predictors may become significant in a multivariate model due to shared variance and control effects. Thus, the regression results are interpreted based on each variable's contribution within the full model rather than on bivariate relationships alone.

Table 18: Binomial Logistic Regression Test of Significant Effect of the level of study habits, self-efficacy, and first quarter performance, on the likelihood of students obtaining pass or fail scores in mathematics tests of Grade 10 students on polynomial functions

Predictor Variable	B	SE	Wald	*p*	Odds Ratio	95% CI for Odds Ratio
Study Habits	-2.763	1.681	2.700	0.100	0.063	[0.002,1.703]
Self-Efficacy	2.256	1.261	3.201	0.074	9.545	[0.806,113.026]
First Quarter Performance	-0.006	0.294	0.000	0.984	0.994	[0.559,1.767]
Constant	0.402	26.983	0.000	0.988	1.495	-

The binomial logistic regression analysis revealed that the level of study habits, self-efficacy, and first-quarter performance did not significantly predict the chances of Grade 10 students obtaining passing or failing scores in mathematics tests on polynomial functions. Study habits showed a negative but non-significant effect (B = −2.763, p = .100), indicating that variations in students' reported study behaviors alone were insufficient to influence test outcomes. Although self-efficacy demonstrated a positive association with the likelihood of passing (B = 2.256, p = .074), the effect was not statistically significant, suggesting that students' confidence in their abilities may not consistently translate into successful performance in polynomial functions without adequate mastery of the concepts. Likewise, first-quarter performance had a negligible and non-significant effect (B = −0.006, p = .984), implying that earlier academic achievement may not reliably predict success in more advanced or topic-specific mathematics assessments. These findings imply that students' pass-fail outcomes in polynomial functions are likely influenced by other factors beyond study habits, self-efficacy, and prior performance, such as instructional approaches, depth of conceptual understanding, and assessment difficulty.

6. CONCLUSION

Based on the findings of the study, it can be concluded that Grade 10 students' performance in polynomial functions is generally low despite their relatively satisfactory study habits, moderate self-efficacy, and very satisfactory first-quarter academic performance. Descriptive results showed that while students frequently demonstrate acceptable study behaviors such as completing homework, reading and note-taking, and maintaining concentration, weaknesses remain in key areas including time management, written work, examination strategies, and seeking teacher consultation. Correlational analyses revealed that study habits and first-quarter performance were not significantly related to mathematics test scores, indicating that these factors alone do not adequately explain achievement in polynomial functions. In contrast, self-efficacy exhibited a moderate and significant positive relationship with mathematics test performance. Multiple linear regression further confirmed that self-efficacy was the only significant predictor of mathematics test scores when other variables were controlled, whereas study habits and first-quarter

performance did not show significant predictive effects. Although binomial logistic regression indicated that none of the predictors significantly influenced pass–fail outcomes, the overall regression model demonstrated meaningful explanatory value. Taken together, the results support a predictive and explanatory model in which self-efficacy plays a central role in mathematics achievement, consistent with social cognitive theory emphasizing the influence of learners' belief in their capabilities on performance. These findings underscore the need for instructional strategies and targeted interventions that strengthen students' mathematical confidence and conceptual understanding to address the gap between classroom grades and topic-specific mastery.

7. RECOMMENDATIONS

1. Mathematics teachers should strengthen concept-based and mastery-oriented instruction in polynomial functions. Given that most students did not meet expectations in the mathematics test despite having satisfactory study habits and first-quarter performance, teachers are encouraged to emphasize conceptual understanding, step-by-step problem-solving, and the use of varied instructional strategies such as guided practice, worked examples, and real-life applications of polynomial concepts.
2. Programs and classroom interventions aimed at enhancing students' self-efficacy should be implemented. Since self-efficacy emerged as a significant predictor of mathematics test performance, teachers may integrate positive feedback, goal-setting activities, and scaffolded tasks that gradually increase in difficulty to help students build confidence in solving polynomial problems.
3. Students should be guided to develop more effective and mathematics-specific study habits, particularly in time management, written work, examination strategies, and teacher consultation. Study skills training that focuses on problem-solving practice, reviewing mistakes, organizing solutions clearly, and seeking timely assistance from teachers may improve the effectiveness of students' independent study.
4. Schools and administrators should provide targeted remediation and enrichment programs for polynomial functions. Diagnostic assessments may be used to identify learning gaps, followed by focused intervention sessions, peer tutoring, or small-group instruction to support students who struggle with polynomial concepts.
5. Future researchers are encouraged to explore additional factors influencing mathematics performance, such as teaching methods, learning styles, classroom environment, instructional materials, and prior conceptual knowledge. Expanding the sample size and incorporating qualitative approaches may also provide deeper insights into students' learning experiences and challenges in mathematics.

QUESTIONNAIRE

EXAMINING THE INFLUENCE OF STUDY HABITS, SELF -EFFICACY AND FIRST QUARTER PERFORMANCE ON MATHEMATICS TEST SCORES USING LINEAR REGRESSION ANALYSIS

Part I. Profile

Directions: Please check (/) or fill in the blanks some items seeking for pertinent information.

Name: (Optional) Year level:

1. Sex: Male Female
2. Age:

Part II. Study Habits

Directions: Please rate the level of study habits. Put a check mark (/) on the box that best describes the level of study habits. Use the following numerical rating and its corresponding verbal description and interpretation.

Homework and Assignment	Always(4)	Most Times(3)	Sometimes(2)	Never(1)
1. When your assigned homework is too long or unusually hard, do you either stop or study only the easier parts of the lesson?				
2. If you have to be absent from class, do you make up				

missed lessons and notes immediately?				
3. Even though an assignment is dull and boring do you stick to it until it is completed				
4. Do you put off doing written assignments until the last minute?				
5. Do you complete and submit your assignments on time?				
6. Do you begin your assignment as soon as the teacher gives them to you and not allow them to pile up?				
Time Allocation				
7. Do you spend too much time talking or listening to the radio for the good of your study?				
8. Do you find that having many other things to do causes you to get behind in your school work?				
9. Do problems outside of the classroom – with other students or at home – cause you to neglect your school work?				
10. Do you study for at least three hours each day after classes?				
11. Is your time unevenly distributed: do you spend too much time on some subjects and not enough on others?				
12. Do you spend too much time reading fiction (Novels), going out, etc. for the good of your school work?				
Reading and Note Taking				
13. In taking notes, do you tend to write down things which later turn out to be unimportant?				
14. After reading several pages of an assignment, do you find yourself unable to remember what you have just read?				
15. Do you find it hard to pick out the unimportant points of a reading assignment?				
16. When reading a long assignment, do you stop now and then to try to remember what you have read?				
17. Do you have to reread materials several times because the words don't have much meaning the first time you go over them?				
18. Do have trouble picking out the important points in the material read or studied				
19. Do you go back and recite to yourself the material you have studied, rechecking any point you find doubtful?				
20. Do you miss important points in the lecture while copying down notes on something which have?				
21. Do you pronounce words to yourself as you read?				
Study Period Procedure				
22. Do you keep all your notes for subject together and carefully arranged for studying?				
23. Do you need a long time to get warmed up when you want to start studying?				
24. Are you unable to study well because you get restless and unable to sit for long?				
25. When you sit down to study, do you find yourself too tired, bored or sleepy to study well?				

26. Do you prefer to study your lessons alone rather than with others?				
27. Do you seem to get very little done far the amount of time you spend studying?				
28. At the beginning of a study period, do you plan your work so that you will make the best use of your time?				
29. Do you find yourself beset by too many health problems to study efficiently?				
Concentration				
30. Do you find that day dreaming distracts your attention from your lessons while studying?				
31. Do you find it hard to keep your mind on what you are studying for any length of time?				
32. Do outside interruptions disturb you while studying?				
Written Work				
33. Do you correct errors on the papers which your teachers have marked and returned to you?				
34. Do you have trouble saying what you want to say on tests, essays and other written work?				
35. Do your teachers criticize your written work for being poorly planned or hurriedly written?				
36. Do you give special attention to neatness on essays, reports and other written work?				
Examination				
37. Do you do poorly on tests because you find it hard to think clearly and plan your work within a short period of time?				
38. Do you get nervous and confused when taking a test and therefore fail to answer questions as well as you otherwise				
39. When getting ready for a test, do you arrange facts to be learned in some planned order?				
40. Are you careless about spelling, punctuation and grammar when answering test questions?				
41. Are you unable to finish tests within the time allowed although you work until the very last minute?				
42. When tests are returned, do you find that your mark has been lowered by careless mistakes?				
43. Do you finish your examination papers and turn them in before time on the examination?				
Teacher Consultation				
44. When you are having trouble with a particular subject, do you try to talk it over with the teacher?				
45. Do you hesitate to ask a teacher for further explanation on a point that is not clear to you?				

*Egbujuo, C., & Ajagun, G. (2019). Measures of Students' Study Habit As predictors of academic achievement in Chemistry***.** *https://shorturl.at/U2o8H*

Part II. Self-Efficacy

Directions: Please rate the level of self-efficacy. Put a check mark (/) on the box that best describes the level of self-efficacy. Use the following numerical rating and its corresponding verbal description and interpretation.

Self-Efficacy	Exactly	Moderately	Hardly	Not at all

	True(4)	True(3)	True(2)	True(1)
1. I can always manage to solve difficult problems if I try hard enough.				
2. If someone opposes me, I can find the means and ways to get what I want.				
3. It is easy for me to stick to my aims and accomplish my goals.				
4. I am confident that I could deal efficiently with unexpected events.				
5. Thanks to my resourcefulness, I know how to handle unforeseen situations.				
6. I can solve most problems if I invest the necessary effort.				
7. I can remain calm when facing difficulties because I can rely on my coping abilities.				
8. When I am confronted with a problem, I can usually find several solutions.				
9. If I am in trouble, I can usually think of a solution.				
10. I can usually handle whatever comes my way.				

Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale. InJ. Weinman, S. Wright, & M. Johnston, Measures in health psychology: A user's portfolio. Causal and control beliefs (pp. 35-37). Windsor, UK: NFER-NELSON.

Republic of the Philippines

JOSE RIZAL MEMORIAL STATE UNIVERSITY

The Premier University in Zamboanga del Norte
KATIPUNAN CAMPUS

CTEd – LABORATORY HIGH SCHOOL

Name (Optional):_____ Grade & Year Level:_____
Signature:

POLYNOMIAL FUNCTION TEST QUESTIONNAIRE

Direction: Choose and encircle the letter of the best answer. Erasures will be charged wrong.

1. Which of the following is a **polynomial function**?
   a. $f(x) = \frac{1}{x}$ b. $f(x) = \sqrt{x} + 2$ c. $f(x) = -5x + 1$ d. $f(x) = \frac{2}{x^2}$
2. What is the degree of the polynomial $f(x) = 7x^4 - 3x^2 + 6$?
   a. 2 b. 3 c. 4 d. 6
3. Find the value of the polynomial $f(x) = 2x^3 - x + 4$ when x = 2.
   a. 14 b. 16 c. 18 d. 20
4. Which of the following is the expanded form of $(2x - 1)(x + 4)$?
   a. $2x^2 + 7x - 4$ c. $2x^2 + 7x + 4$
   b. $2x^2 + 8x - 1$ d. $2x^2 + 6x - 4$
5. If $f(x) = x^2 - 9$, what is the value of f(5)?
   a. 14 b. 16 c. 18 d. 25
6. What does it mean to evaluate a polynomial function?
   a. To factor the polynomial into its simplest form.
   b. To find the value of a function into a given value of x.
   c. To determine the highest degree of the polynomial.
   d. TO find the roots or zeroes of the function.
7. What is the first step performed to find *p(2)* for a given polynomial *p(x)*?
   a. Replace every *x* in *p(x)* with 2.
   b. Multiply the entire function by 2.
   c. Subtract 2 from every coefficient.
   d. Divide the polynomial by 2.
8. Why does the term $3(x + 2)^2$ becomes $3(x^2 + 4x + 4)$?
   a. The 3 was multiplied by *x* and then by *2*.
   b. The exponent 2 was distributed to *x* and 2 individually.
   c. The binomial $(x + 2)$ was expanded(squared) before multiplying by the coefficient 3.
   d. The term was simplified using synthetic division.
9. Evaluate $p(x) = 2x^3 - x - 5$ for $x = -2$ using the substitution method.
   a. -11 b. -19 c. -23 d. 15
10. If you use synthetic division to evaluate $(x) = x^2 + 4x + 4$ at $x = -2$, what will be the final number (remainder) in the bottom row?
    a. 16 b. 8 c. 0 d. -4
11. What is the first step in simplifying $(x - 1)$ for the function $p(x) = x^2 + 3$?
    a. $(x - 1) + 3$ b. $x^2 - 1^2 + 3$ c. $(x - 1)^2 + 3$ d. $x^2 + 3 - 1$
12. If $(x) = x^3 + x^2 + x + 1$, what is the result of applying $p(0)$?
    a. 0 b. 1 c. 3 d. 4
13. Apply the distribution and simplification steps to find $p\ (2a)$ for $(x) = 3x - 7$.
    a. 6a – 7 b. 5a – 7 c. 6a – 14 d. 32a – 7
14. A company's profit is modeled by the function $(x) = x^3 + x^2 - 7x - 3$. What is the profit when $x = 2$ units are sold?
    a. 17 b. 0 c. -5 d. -9
15. A local shop uses the linear function $(x) = 4x - 2$ to calculate costs. If the input x is replaced by the new variable $(a - 3)$, what is new expression?
    a. $4a - 14$ b. $4a - 5$ c. $4a - 12$ d. $4a + 6$
16. What is the conceptual relationship between the zeroes of a polynomial function and a polynomial equation?
    a. They are completely unrelated mathematical concepts.
    b. The zeroes of a function are the roots of the corresponding equation where $(x) = 0$.
    c. Zeroes only exist for functions, while roots only exist for equations.
    d. The zero of a function is always the leading coefficient of the equation.
17. Apply the Number of Zeroes Theorem to determine the exact number of zeroes for the function $f(x) = 5x^6 - 3x^4 + 2x - 1$.
    a. 4 b. 5 c. 6 d. 1
18. A polynomial has a zero of $3i$. Based on the rule for complex roots, what other value must also be a zero?
    a. 3 b. $\sqrt{3}$ c. $-3i$ d. 0
19. Apply the Fundamental Theorem of Algebra. If a polynomial has a degree of 4, what is the minimum number of zeroes it must have?
    a. 0 b. 1 c. 4 d. infinite
20. A projectile's path is modeled by $(x) = 3x^4 - 16x^3 + 14x^2 + 24x - 9$. If 3 is a zero of multiplicity 2, how many times should synthetic division be applied to find the depressed quadratic equation?
    a. Once b. Twice c. Three times d. Four times

References

1. Abalde, G. D., & Oco, R. M. (2023). Factors associated with mathematics performance. Asian Research Journal of Mathematics, 19(6), 45-60. https://doi.org/10.9734/arjom/2023/v19i6665
2. BALFANZ, R., HERZOG, L., & MAC IVER, D. J. (2007). Preventing student disengagement and keeping students on the graduation path in urban middle-grades schools: Early identification and effective interventions. Educational Psychologist, 42(4), 223-235. https://doi.org/10.1080/00461520701621079
3. Campanilla, N. S. (2025). Self-efficacy in mathematics: A predictor in the mathematics performance of grade 8 learners. Journal of Social, Humanity, and Education, 5(2), 87-103.
4. https://doi.org/10.35912/jshe.v5i2.2228
1. 5. Credé, M., & Kuncel, N. R. (2008). Study habits, skills, and attitudes: The third pillar supporting collegiate academic performance. Perspectives on Psychological Science, 3(6), 425-
5. 453. https://doi.org/10.1111/j.1745-6924.2008.00089.x
6. Cuizon, K. A., De Luna, F. Y., Natividad, A. G., Ortiz, J. Z., Osorio, L. V., Juan, K. B., & Punzalan, C. H. (2022). Learning style preferences, study habits, and academic performance in mathematics: Perspectives of freshmen college students amidst the COVID-19 pandemic. International Journal of Research in STEM Education, 4(2), 39-57. https://doi.org/10.33830/ijrse.v4i2.254
7. Duncan, G. J., Dowsett, C. J., Claessens, A., Magnuson, K., Huston, A. C., Klebanov, P., Pagani, L. S., Feinstein, L., Engel, M., Brooks-Gunn, J., Sexton, H., Duckworth, K., & Japel, C. (2007). School readiness and later achievement. Developmental Psychology, 43(6), 1428-1446. https://doi.org/10.1037/0012-
8. 1649.43.6.1428
9. Erika Mae P. Asoy, & Rholey R. Picaza. (2025). Persistence, self-efficacy, and achievement in mathematics. EPRA International Journal of Multidisciplinary Research (IJMR), 583-593.
10. https://doi.org/10.36713/epra20603
11. Elango, M., & Manimozhi, G. (2021). Meta analysis of study habits and academic achievement. Shanlax International Journal of Arts, Science and Humanities, 8(4), 139-
12. 145. https://doi.org/10.34293/sijash.v8i4.3722
13. Etcuban, J. O., Capuno, R., Necesario, R., Espina, R., Padillo, G., & Manguilimotan, R. (2019). Attitudes, study habits, and academic performance of junior high school students in mathematics. International Electronic Journal of Mathematics Education, 14(3). https://doi.org/10.29333/iejme/5768
14. Falebita, O. S., Asanre, A. A., & Chibisa, A. (2025). A structural equation modeling of predictive factors of mathematics undergraduates academic achievement. Frontiers in Education, 10.
15. https://doi.org/10.3389/feduc.2025.1572840
16. Jameson, M. M., Dierenfeld, C., & Ybarra, J. (2022). The mediating effects of specific types of self-efficacy on the relationship between math anxiety and performance. Education Sciences, 12(11), 789. https://doi.org/10.3390/educsci12110789
17. M. Corpuz, J. (2024). 21st century learning skills, study habits, and the mathematics performance of grade 7 students. INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH AND ANALYSIS, 07(09).
18. https://doi.org/10.47191/ijmra/v7-i09-26
19. Purnaningtyas, Y., & Safa'atullah, M. F. (2023). Students' mathematical literacy ability in terms of self efficacy through problem based learning with PMRI approach. Unnes Journal of Mathematics Education, 12(1), 34-41. https://doi.org/10.15294/ujme.v12i1.67553
20. Roslan, N. A., & Maat, S. M. (2019). Systematic literature review on secondary school students' mathematics self-efficacy. International Journal of Academic Research in Progressive Education and Development, 8(4). https://doi.org/10.6007/ijarped/v8-i4/6817
21. Ruijia, Z., Talib, O., Binti Burhanuddin, N. A., & Wenling, L. (2022). The effect of math self-concept and self-efficacy on the math achievement of sixth-grade primary school students: The mediating role of math anxiety. International Journal of Academic Research in Progressive Education and Development, 11(3). https://doi.org/10.6007/ijarped/v11-i3/14721
22. Sirin, S. R. (2005). Socioeconomic status and academic achievement: A meta-analytic review of research.
23. Review of Educational Research, 75(3), 417-453. https://doi.org/10.3102/00346543075003417
24. Travero, A., Nagal, C. J., & Herda, R. K. (2025). Study habits, mathematics performance and gender differences of agriculture students amidst the new normal. Jurnal Wahana Pendidikan, 12(1), 15. https://doi.org/10.25157/jwp.v12i1.16856
25. Yang, Y., Maeda, Y., & Gentry, M. (2024). The relationship between mathematics self-efficacy and mathematics achievement: Multilevel analysis with NAEP 2019. Large-scale Assessments in Education,
26. 12(1). https://doi.org/10.1186/s40536-024-00204-z
27. Zimmerman, B. J., & Kitsantas, A. (2014). Comparing students' self-discipline and self-regulation measures and their prediction of academic achievement. Contemporary Educational Psychology, 39(2), 145-155. https://doi.org/10.1016/j.cedpsych.2014.03.004

28. -, A. E., & -, R. S. (2016). Revisiting the study habits and performance in math of grade 7 students: A basis for a proposed enhancement program. Researchers World : Journal of Arts, Science and Commerce, VII(2), 77-82. https://doi.org/10.18843/rwjasc/v7i2/07