



To the Student:

After your registration is complete and your proctor has been approved, you may take the Credit by Examination for MATH 6B.

WHAT TO BRING

- several sharpened No. 2 pencils
- lined notebook paper
- graph paper
- straightedge ruler

ABOUT THE EXAM

The examination for the first semester of Mathematics, Grade 6, consists of 40 questions (35 multiple choice questions worth 2 points each and 5 short-answer questions worth 6 points each). The exam is based on the Texas Essential Knowledge and Skills (TEKS) for this subject. The full list of TEKS is included in this document (it is also available online at the Texas Education Agency website, <http://www.tea.state.tx.us/>). The TEKS outline specific topics covered in the exam, as well as more general areas of knowledge and levels of critical thinking. Use the TEKS to focus your study in preparation for the exam.

The examination will take place under supervision, and the recommended time limit is three hours. A 6th grade mathematics chart is included in the exam papers for your reference. You may not use any other notes or books. A percentage score from the examination will be reported to the official at your school.

In preparation for the examination, review the TEKS for this subject. All TEKS are assessed. It is important to prepare adequately. Since questions are not taken from any one course, you can prepare by reviewing any of the state-adopted textbooks that are used at your school. The textbook used with our MATH 6B course is:

Burger, et al., *Texas Go Math!*, Grade 6. (2015) Houghton Mifflin Harcourt.

Texas Essential Knowledge and Skills covered on this exam:

- 6.1A, B, C, D, E, F, G
- 6.6A, B, C
- 6.7A, B, C, D
- 6.8A, B, C, D
- 6.9A, B, C
- 6.10A, B

- 6.11
- 6.12A, B, C, D
- 6.13A, B
- 6.14A, B, C, D, E, F, G, H

Topics to be covered:

Expressions, Equations, and Relationships

- Generating Equivalent Numerical Expressions
- Generating Equivalent Algebraic Expressions
- Equations and Relationships
- Inequalities and Relationships
- Relationships in Two Variables

Relationships in Geometry

- Angles, Triangles, and Equations
- Area and Volume Equations

Measurement and Data

- Displaying, Analyzing, and Summarizing Data

Personal Financial Literacy

- Becoming a Knowledgeable Consumer and Investor

MATH 6B Practice Exam

Part A: (2 points each)

Read each question carefully. When you have solved the problem, write the letter of each answer in the space provided on the answer sheet. A sixth-grade math chart is provided at the back of this exam.

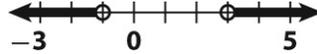
1. What is the value of a number n raised to the power of 0?
 - A. n
 - B. 0
 - C. 1
 - D. It depends on the value of n .
2. How many integer factors greater than 1 does the number 30 have?
 - A. 6
 - B. 7
 - C. 10
 - D. 14
3. When are two expressions equivalent?
 - A. They always have the same value.
 - B. They always have the same variables.
 - C. They always use the same operations.
 - D. They both always contain parentheses.
4. Which values are solutions of the equation below?

$$7m - 2 = m(4 + m)$$

- A. -1 and -2
 - B. -1 and 2
 - C. 1 and -2
 - D. 1 and 2
5. In $\triangle ABC$, $m\angle A = 90^\circ$ and $m\angle B = 30^\circ$. Let x be the measure of $\angle C$. Which equation represents this situation?
 - A. $30 + x = 90$
 - B. $30 = x + 90$
 - C. $30 + x = 180$
 - D. $30 = x + 180$

continued →

6. Which statement describes the set of numbers shown on this number line?



- A. $x \neq -1$ and $x \neq 3$
 B. $x < -1$ and $x > 3$
 C. $x < -1$ or $x > 3$
 D. x is between -1 and 3
7. Berries are \$3 per pound. Which inequality shows the number n of pounds of berries you can buy if you have \$20 and also buy a \$5 fruit basket?

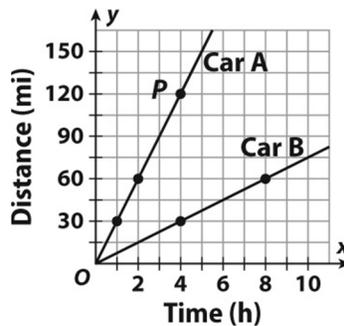
- A. $3 + n \leq 20 - 5$
 B. $3 + 5n \leq 20$
 C. $3n + 5 \leq 20$
 D. $3n + 5n \leq 20$

8. What is the solution to the inequality below?

$$-3x + 4 < 16$$

- A. $x < -4$
 B. $x < -\frac{20}{3}$
 C. $x > -4$
 D. $x > -\frac{20}{3}$

Use the graph for 9-11.



9. What are the coordinates of the point on the graph for Car B that is on the same vertical line as point P ?
- A. $(4, 2)$
 B. $(4, 30)$
 C. $(4, 120)$
 D. $(8, 60)$

10. In which units is the independent variable measured?

- A. hours
- B. miles
- C. time
- D. distance

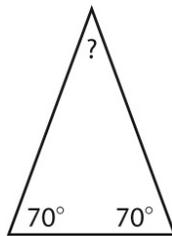
11. What can you conclude from the graph?

- A. Car A is faster.
- B. Car B is faster.
- C. Car A travels a longer distance.
- D. Car B makes frequent stops.

12. Which group of three side lengths will form a triangle?

- A. 11, 5, 4
- B. 22, 17, 14
- C. 28, 15, 10
- D. 30, 15, 14

13. What is the measure of the unknown angle in the triangle below?



- A. 35°
- B. 70°
- C. 40°
- D. 140°

14. A triangle has side lengths of 15 inches and 30 inches. It also has angles that measure 45° and 20° . Which of the following identifies the possible third side length and third angle of the triangle?

- A. 15 in., 65°
- B. 45 in., 65°
- C. 17 in., 115°
- D. 14 in., 115°

15. Which of the following statements about the relationship of angles and sides in a triangle is true?

- A. The longest side is opposite the smallest angle.
- B. The longest side is opposite the largest angle.
- C. The midsize angle is opposite the smallest angle.
- D. The smallest angle is opposite the midsize angle.

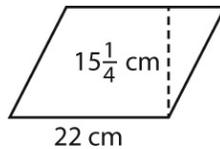
16. A window is shaped like a parallelogram. The base of the window is 27 inches. Its area is 445.5 square inches. What is the height of the window?

- A. 16.5 in
- B. 8.25 in.
- C. 33 in.
- D. 27 in.

17. A right triangle includes one angle that measures 30° . What is the measure of the third angle?

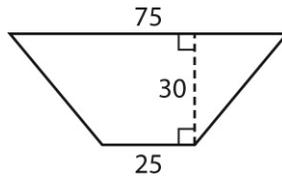
- A. 30°
- B. 90°
- C. 60°
- D. 130°

18. What is the area of the parallelogram below?



- A. 167.75 cm^2
- B. 335.5 cm^2
- C. 341 cm^2
- D. 671 cm^2

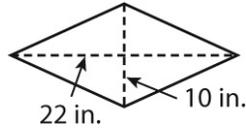
19. Which equation can be used to find the area of the figure below?



- A. $A = \frac{75}{2} \times 30$
- B. $A = \frac{75 - 25}{2} \times 30$
- C. $A = \frac{75 + 25}{2} \times 30$
- D. $A = (75 + 25) \times 30$

continued →

20. What is the area of the rhombus below?

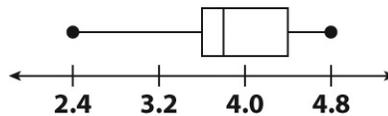


- A. 32 in^2
B. 64 in^2
C. 110 in^2
D. 220 in^2
21. Gemma recorded the ages of students at an after-school club. The ages of the students are shown in the data set below.

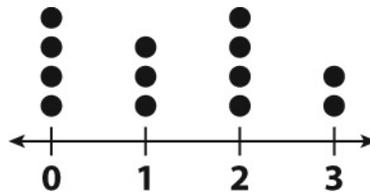
{11, 12, 13, 13, 15, 16}

Another student joins the club. She is 17 years old. Which of the following does **not** change?

- A. mean
B. median
C. range
D. stem-and-leaf plot
22. What is the median of the data represented in the box plot below?



- A. 2.4
B. 3.5
C. 3.8
D. 4.5
23. What is the median of the data represented in the line plot below?



- A. 0.5
B. 1.0
C. 1.5
D. 2.0

continued →

24. What is the range for the data shown in the stem-and-leaf plot below?

Stem	Leaves
7	2 3 4 4 5 8 9
8	1 2 2 3 5 5 7 9
9	0 1 2 3 3 4 5 8 8 9
10	0 0 0

Key: 8|1 means 81

- A. 28
B. 40
C. 85
D. 72
25. For which of the following data sets is the mean equal to the median?
- A. {1, 4, 6, 7}
B. {2, 5, 6, 9}
C. {2, 4, 6, 9}
D. {1, 5, 9, 10}
26. What is the median for the data set below?

2.6	6.7	6.5	8.8
3.8	7.3	4.0	12.5

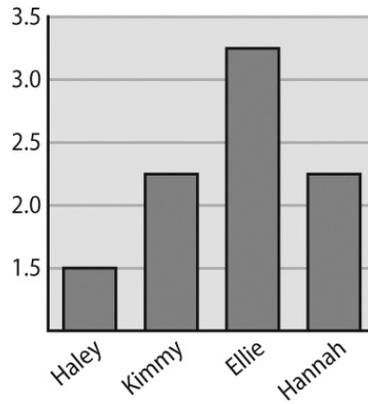
- A. 6.0
B. 6.25
C. 6.6
D. 6.9
27. For the data set below, which of the following measures is greatest?

{2.5, 4.4, 4.4, 5.2, 6.3, 8.1, 9.9, 10.5}

- A. mean
B. median
C. range
D. mode

continued →

Use the graph for 8 and 9.



The bar graph shows the amount of juice in liters in four students' containers.

28. How many more liters does Ellie have than Haley?
- A. 1.5 L
 - B. 1.75 L
 - C. 2.0 L
 - D. 2.25 L
29. Suppose Hannah has twice as much juice. How many more liters than Ellie would she have?
- A. 0.75 L
 - B. 1.25 L
 - C. 2.25 L
 - D. 4.5 L
30. Nina wants to buy a sweater. Which method costs the least?
- A. using a credit card with an 18% interest rate and paying off her entire balance in full after receiving the monthly bill
 - B. using a credit card with a 6% interest rate and paying off the balance over the course of a year
 - C. writing a check from an account that charges \$10 a month for checking
 - D. using a debit card that charges \$0.75 for each debit transaction
31. Seth's bank charges \$7 a month to maintain a checking account and \$0.50 for each check Seth writes. Last month, Seth paid a total of \$11.50 in checking account fees. Which equation can you use to find how many checks Seth wrote?
- A. $4.5 = 7x$
 - B. $7 = 0.5x$
 - C. $0.5 = 11.5x$
 - D. $4.5 = 0.5x$

32. Patty has a checking account at a local bank where the monthly checking fee is \$10 plus \$0.30 for each check she writes. Nonbank ATM withdrawals cost \$2.50. At the beginning of the month, Patty's checking account balance was \$2,740.50. She deposited \$1,325 from her job and withdrew \$475 in cash from a nonbank ATM. She wrote a check for \$125 and transferred \$500 to her savings account. What is her checking account balance at the end of the month?
- A. \$2,422.30
 - B. \$2,952.70
 - C. \$3,401.20
 - D. \$3,520.50
33. Which of the following would **not** have a positive effect on your credit score?
- A. getting a promotion at work
 - B. making late payments on a car loan
 - C. paying credit card balances in full
 - D. having a low debt-to-income ratio
34. Myra has been at her job for 3 months. She earns \$3,520 per month. She has a low debt-to-income ratio. She has made 3 late payments on her student loan and 2 late payments on her credit card. Which of the following is most likely her credit score?
- A. 800
 - B. 750
 - C. 620
 - D. 580
35. Joaquin is going to a college where the cost for one year is \$11,800. He has a scholarship worth \$3,500 and a grant worth \$450. His parents will pay for 75% of the remaining costs. He earns \$210 a week at his job. How many weeks does Joaquin need to work to afford a year of college?
- A. 9.3
 - B. 10.1
 - C. 11.7
 - D. 12.4

Part B (6 points each)

Read each question carefully. Be sure to set up your problem, work it out, and label your final answer(s) correctly. Partial credit will be given when possible. A sixth grade math chart is provided at the back of this exam.

36. Evaluate the expression below for $x = -3$ and $y = 2$.

$$5y(x + 10)^2$$

continued →

37. Solve the inequality below. Graph the solution on a number line.

$$2y - 6 < -10$$

38. Janis has a box that is filled with toys. The box is $4\frac{1}{2}$ feet long, $\frac{1}{2}$ foot wide, and 2 feet high. What is the volume of the box?

39. Eli has a box that is 2 inches wide, 4 inches long, and 10 inches high. Gary has a box whose volume is 3 times as great as Eli's. What is the volume of Gary's box?

continued →

40. Miguel bought a book for \$12 using a credit card that charges a 15% fee for each month if the bill is not paid in full. He waited 2 months to pay off the bill. Jill bought the same book at another store for \$15 using her debit card. Her bank charges \$0.40 for each debit card transaction. Who paid more for the book?

MATH CHART

LENGTH

Customary

1 mile (mi) = 1,760 yards (yd)

1 yard (yd) = 3 feet (ft)

1 foot (ft) = 12 inches (in.)

Metric

1 kilometer (km) = 1,000 meters (m)

1 meter (m) = 100 centimeters (cm)

1 centimeter (cm) = 10 millimeters (mm)

VOLUME AND CAPACITY

Customary

1 gallon (gal) = 4 quarts (qt)

1 quart (qt) = 2 pints (pt)

1 pint (pt) = 2 cups (c)

1 cup (c) = 8 fluid ounces (fl oz)

Metric

1 liter (L) = 1000 milliliters (mL)

MASS AND WEIGHT

Customary

1 ton (T) = 2000 pounds (lb)

1 pound (lb) = 16 ounces (oz)

Metric

1 kilogram (kg) = 1000 grams (g)

1 gram (g) = 1000 milligrams (mg)

TIME

1 year = 365 days

1 year = 12 months

1 year = 52 weeks

1 week = 7 days

1 day = 24 hours

1 hour = 60 minutes

1 minute = 60 seconds

PERIMETER

Square

$$P = 4s$$

Rectangle

$$P = 2l + 2w \text{ or } P = 2(l + w)$$

CIRCUMFERENCE

Circle $C = 2\pi r$ or $C = \pi d$

AREA

Triangle $A = \frac{bh}{2}$ or $A = \frac{1}{2}bh$

Square $A = s^2$

Rectangle $A = lw$ or $A = bh$

Parallelogram $A = bh$

Trapezoid $A = \frac{(b_1 + b_2)h}{2}$ or $A = \frac{1}{2}(b_1 + b_2)h$

Circle $A = \pi r^2$

VOLUME

Cube $V = s^3$

Rectangular prism $V = lwh$ or

ADDITIONAL INFORMATION

Pi $\pi \approx 3$

MATH 6B Practice Exam Answer Key

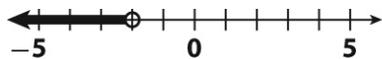
Part A.(2 points each)

- | | | |
|-------|-------|-------|
| 1. C | 13. C | 25. B |
| 2. B | 14. C | 26. C |
| 3. A | 15. B | 27. C |
| 4. D | 16. A | 28. B |
| 5. A | 17. C | 29. B |
| 6. C | 18. B | 30. A |
| 7. C | 19. C | 31. D |
| 8. C | 20. C | 32. B |
| 9. B | 21. B | 33. B |
| 10. A | 22. C | 34. C |
| 11. A | 23. B | 35. A |
| 12. B | 24. A | |

Part B: (6 points each)

36. 490

37. $y < -2$



38. 4.5 cubic feet

39. 240 cubic inches

40. Miguel

Texas Essential Knowledge and Skills MATH 6: Mathematics, Grade 6

§111.26. Grade 6, Adopted 2012.

(a) Introduction.

(1) The desire to achieve educational excellence is the driving force behind the Texas essential knowledge and skills for mathematics, guided by the college and career readiness standards. By embedding statistics, probability, and finance, while focusing on computational thinking, mathematical fluency, and solid understanding, Texas will lead the way in mathematics education and prepare all Texas students for the challenges they will face in the 21st century.

(2) The process standards describe ways in which students are expected to engage in the content. The placement of the process standards at the beginning of the knowledge and skills listed for each grade and course is intentional. The process standards weave the other knowledge and skills together so that students may be successful problem solvers and use mathematics efficiently and effectively in daily life. The process standards are integrated at every grade level and course. When possible, students will apply mathematics to problems arising in everyday life, society, and the workplace. Students will use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution. Students will select appropriate tools such as real objects, manipulatives, algorithms, paper and pencil, and technology and techniques such as mental math, estimation, number sense, and generalization and abstraction to solve problems. Students will effectively communicate mathematical ideas, reasoning, and their implications using multiple representations such as symbols, diagrams, graphs, computer programs, and language. Students will use mathematical relationships to generate solutions and make connections and predictions. Students will analyze mathematical relationships to connect and communicate mathematical ideas. Students will display, explain, or justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

(3) The primary focal areas in Grade 6 are number and operations; proportionality; expressions, equations, and relationships; and measurement and data. Students use concepts, algorithms, and properties of rational numbers to explore mathematical relationships and to describe increasingly complex situations. Students use concepts of proportionality to explore, develop, and communicate mathematical relationships. Students use algebraic thinking to describe how a change in one quantity in a relationship results in a change in the other. Students connect verbal, numeric, graphic, and symbolic representations of relationships, including equations and inequalities. Students use geometric properties and relationships, as well as spatial reasoning, to model and analyze situations and solve problems. Students communicate information about geometric figures or situations by quantifying attributes, generalize procedures from measurement experiences, and use the procedures to solve problems. Students use appropriate statistics, representations of data, and reasoning to draw conclusions, evaluate arguments, and make recommendations. While the use of all types of technology is important, the emphasis on algebra readiness skills necessitates the implementation of graphing technology.

(4) Statements that contain the word "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(b) Knowledge and skills.

(1) Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

(A) apply mathematics to problems arising in everyday life, society, and the workplace;

(B) use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution;

(C) select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems;

(D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;

(E) create and use representations to organize, record, and communicate mathematical ideas;

(F) analyze mathematical relationships to connect and communicate mathematical ideas; and

(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

(2) Number and operations. The student applies mathematical process standards to represent and use rational numbers in a variety of forms. The student is expected to:

(A) classify whole numbers, integers, and rational numbers using a visual representation such as a Venn diagram to describe relationships between sets of numbers;

(B) identify a number, its opposite, and its absolute value;

(C) locate, compare, and order integers and rational numbers using a number line;

(D) order a set of rational numbers arising from mathematical and real-world contexts; and

(E) extend representations for division to include fraction notation such as a/b represents the same number as $a \div b$ where $b \neq 0$.

(3) Number and operations. The student applies mathematical process standards to represent addition, subtraction, multiplication, and division while solving problems and justifying solutions. The student is expected to:

- (A) recognize that dividing by a rational number and multiplying by its reciprocal result in equivalent values;
- (B) determine, with and without computation, whether a quantity is increased or decreased when multiplied by a fraction, including values greater than or less than one;
- (C) represent integer operations with concrete models and connect the actions with the models to standardized algorithms;
- (D) add, subtract, multiply, and divide integers fluently; and
- (E) multiply and divide positive rational numbers fluently.

(4) Proportionality. The student applies mathematical process standards to develop an understanding of proportional relationships in problem situations. The student is expected to:

- (A) compare two rules verbally, numerically, graphically, and symbolically in the form of $y = ax$ or $y = x + a$ in order to differentiate between additive and multiplicative relationships;
- (B) apply qualitative and quantitative reasoning to solve prediction and comparison of real-world problems involving ratios and rates;
- (C) give examples of ratios as multiplicative comparisons of two quantities describing the same attribute;
- (D) give examples of rates as the comparison by division of two quantities having different attributes, including rates as quotients;
- (E) represent ratios and percents with concrete models, fractions, and decimals;
- (F) represent benchmark fractions and percents such as 1%, 10%, 25%, 33 1/3%, and multiples of these values using 10 by 10 grids, strip diagrams, number lines, and numbers;
- (G) generate equivalent forms of fractions, decimals, and percents using real-world problems, including problems that involve money; and
- (H) convert units within a measurement system, including the use of proportions and unit rates.

(5) Proportionality. The student applies mathematical process standards to solve problems involving proportional relationships. The student is expected to:

- (A) represent mathematical and real-world problems involving ratios and rates using scale factors, tables, graphs, and proportions;
- (B) solve real-world problems to find the whole given a part and the percent, to find the part given the whole and the percent, and to find the percent given the part and the whole, including the use of concrete and pictorial models; and
- (C) use equivalent fractions, decimals, and percents to show equal parts of the same whole.

(6) Expressions, equations, and relationships. The student applies mathematical process standards to use multiple representations to describe algebraic relationships. The student is expected to:

- (A) identify independent and dependent quantities from tables and graphs;
- (B) write an equation that represents the relationship between independent and dependent quantities from a table; and
- (C) represent a given situation using verbal descriptions, tables, graphs, and equations in the form $y = kx$ or $y = x + b$.

(7) Expressions, equations, and relationships. The student applies mathematical process standards to develop concepts of expressions and equations. The student is expected to:

- (A) generate equivalent numerical expressions using order of operations, including whole number exponents and prime factorization;
- (B) distinguish between expressions and equations verbally, numerically, and algebraically;
- (C) determine if two expressions are equivalent using concrete models, pictorial models, and algebraic representations; and
- (D) generate equivalent expressions using the properties of operations: inverse, identity, commutative, associative, and distributive properties.

(8) Expressions, equations, and relationships. The student applies mathematical process standards to use geometry to represent relationships and solve problems. The student is expected to:

- (A) extend previous knowledge of triangles and their properties to include the sum of angles of a triangle, the relationship between the lengths of sides and measures of angles in a triangle, and determining when three lengths form a triangle;
- (B) model area formulas for parallelograms, trapezoids, and triangles by decomposing and rearranging parts of these shapes;
- (C) write equations that represent problems related to the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers; and
- (D) determine solutions for problems involving the area of rectangles, parallelograms, trapezoids, and triangles and volume of right rectangular prisms where dimensions are positive rational numbers.

(9) Expressions, equations, and relationships. The student applies mathematical process standards to use equations and inequalities to represent situations. The student is expected to:

- (A) write one-variable, one-step equations and inequalities to represent constraints or conditions within problems;
 - (B) represent solutions for one-variable, one-step equations and inequalities on number lines; and
 - (C) write corresponding real-world problems given one-variable, one-step equations or inequalities.
- (10) Expressions, equations, and relationships. The student applies mathematical process standards to use equations and inequalities to solve problems. The student is expected to:
- (A) model and solve one-variable, one-step equations and inequalities that represent problems, including geometric concepts; and
 - (B) determine if the given value(s) make(s) one-variable, one-step equations or inequalities true.
- (11) Measurement and data. The student applies mathematical process standards to use coordinate geometry to identify locations on a plane. The student is expected to graph points in all four quadrants using ordered pairs of rational numbers.
- (12) Measurement and data. The student applies mathematical process standards to use numerical or graphical representations to analyze problems. The student is expected to:
- (A) represent numeric data graphically, including dot plots, stem-and-leaf plots, histograms, and box plots;
 - (B) use the graphical representation of numeric data to describe the center, spread, and shape of the data distribution;
 - (C) summarize numeric data with numerical summaries, including the mean and median (measures of center) and the range and interquartile range (IQR) (measures of spread), and use these summaries to describe the center, spread, and shape of the data distribution; and
 - (D) summarize categorical data with numerical and graphical summaries, including the mode, the percent of values in each category (relative frequency table), and the percent bar graph, and use these summaries to describe the data distribution.
- (13) Measurement and data. The student applies mathematical process standards to use numerical or graphical representations to solve problems. The student is expected to:
- (A) interpret numeric data summarized in dot plots, stem-and-leaf plots, histograms, and box plots; and
 - (B) distinguish between situations that yield data with and without variability.
- (14) Personal financial literacy. The student applies mathematical process standards to develop an economic way of thinking and problem solving useful in one's life as a knowledgeable consumer and investor. The student is expected to:
- (A) compare the features and costs of a checking account and a debit card offered by different local financial institutions;
 - (B) distinguish between debit cards and credit cards;
 - (C) balance a check register that includes deposits, withdrawals, and transfers;
 - (D) explain why it is important to establish a positive credit history;
 - (E) describe the information in a credit report and how long it is retained;
 - (F) describe the value of credit reports to borrowers and to lenders;
 - (G) explain various methods to pay for college, including through savings, grants, scholarships, student loans, and work-study; and
 - (H) compare the annual salary of several occupations requiring various levels of post-secondary education or vocational training and calculate the effects of the different annual salaries on lifetime income.

Source: The provisions of this §111.26 adopted to be effective September 10, 2012, 37 TexReg 7109.