To the Student:

After your registration is complete and your proctor has been approved, you may take the Credit by Examination for MATH 7A.

WHAT TO BRING

- several sharpened No. 2 pencils
- lined notebook paper

ABOUT THE EXAM

The examination for the first semester of Mathematics consists of 40 questions, of which 35 are multiple choice and the rest are short answer. 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. You may not use any 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. A list of review topics is included in this document to focus your studies. It is important to prepare adequately. Since questions are not taken from any one source, you can prepare by reviewing any of the state-adopted textbooks that are used at your school. The textbook used with our MATH 7A course is:

> Charles, Illingworth, McNemar, Mills, Ramirez, and Reeves. (2008).
> *Texas Mathematics, Course 2*. Boston, MA: Pearson Prentice Hall.
> ISBN 0-13-134018-2

The practice exam included in this document will give you a model of the types of questions that will be asked on your examination. It is **not** a duplicate of the actual examination. It is provided to illustrate the format of the exam, not to serve as a complete review sheet.

Good luck on your examination!

MATH 7A Concepts

Rational Numbers	Ratios and Proportional Relationships	Probability	Linear Relationships
Relationship between sets of rational numbers	Unit rates	Experimental probability of simple events	Linear relationships in the form $y = mx + b$
Operations with rational numbers (addition, subtraction, multiplication, and division)	Constant rates of change	Experimental probability of compound events	Writing and graphing equations in the form $y = mx + b$
Real-world applications with rational numbers	Proportional relationships and graphs	Making predictions with experimental probability	
	Converting between measurement systems	Theoretical probability of simple events	
	Percent increase and decrease	Theoretical probability of compound events	
	Mark-up and mark-down	Making predictions with theoretical probability	
	Applications of percent		
	Similar shapes and proportions		
	Using similar shapes		
	Similar shapes and scale drawings		
	Ratios and pi		

MATH 7A Practice Exam

Multiple Choice. Choose the best answer for each question.

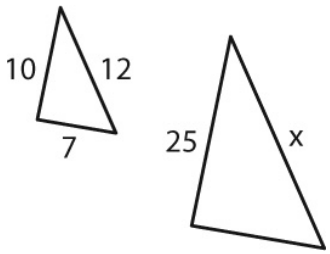
1. To which set or sets does the number 8 belong?

   A. integers only
   B. rational numbers only
   C. integers and rational numbers only
   D. whole numbers, integers, and rational numbers

2. What is the product of (–2.6)(4.8)(–3)?

   A. –37.44
   B. –374.4
   C. 3.744
   D. 37.44

3. The two triangles below are similar. What is the length of side *x*?



   A. 30
   B. 27
   C. 48
   D. 22

4. Why does this table **not** show a proportional relationship?

Time in Weeks (*x*)	2	4	6	8
Savings in Dollars (*y*)	60	120	240	480

   A. The ratio $x : y$ equals 1 : 30.
   B. The ratio $x : y$ is not constant.
   C. The savings does not stay constant.
   D. The savings is not increasing fast enough.

continued →

5. Find the constant of proportionality, given the information in the table.

Number of pounds	2	3	8
Cost ($)	19	28.50	76

A. 9.50
B. 4.50
C. 11
D. 5

6. Li rolls a number cube that has sides labeled 1 to 6 and then flips a coin. What is the probability that she rolls an odd number and flips tails?

A. $\frac{1}{8}$
B. $\frac{1}{4}$
C. $\frac{1}{2}$
D. $\frac{3}{4}$

7. If Cole flips a coin three times, what is the probability that he will flip tails at least twice?

A. $\frac{1}{8}$
B. $\frac{3}{8}$
C. $\frac{4}{8}$
D. $\frac{7}{8}$

continued →

8. **Deirdre's Experimental Outcomes**

Deirdre flipped a coin then spun a spinner 5 times. The results are shown in the table below. What is the experimental probability that Deirdre spun green?

Trial	Outcome
1	Red, H
2	Red, T
3	Blue, T
4	Green, H
5	Blue, T

A. $\frac{1}{4}$

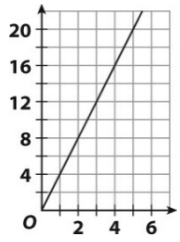
B. $\frac{1}{5}$

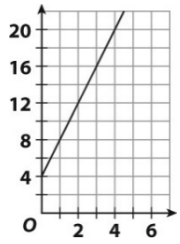
C. $\frac{4}{5}$

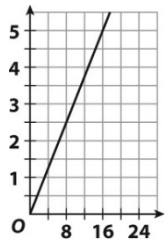
D. $\frac{1}{3}$

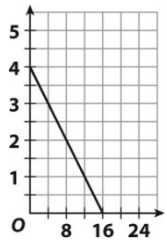
continued →

9. Which graph represents the relationship $y = 4x$?

A. 

B. 

C. 

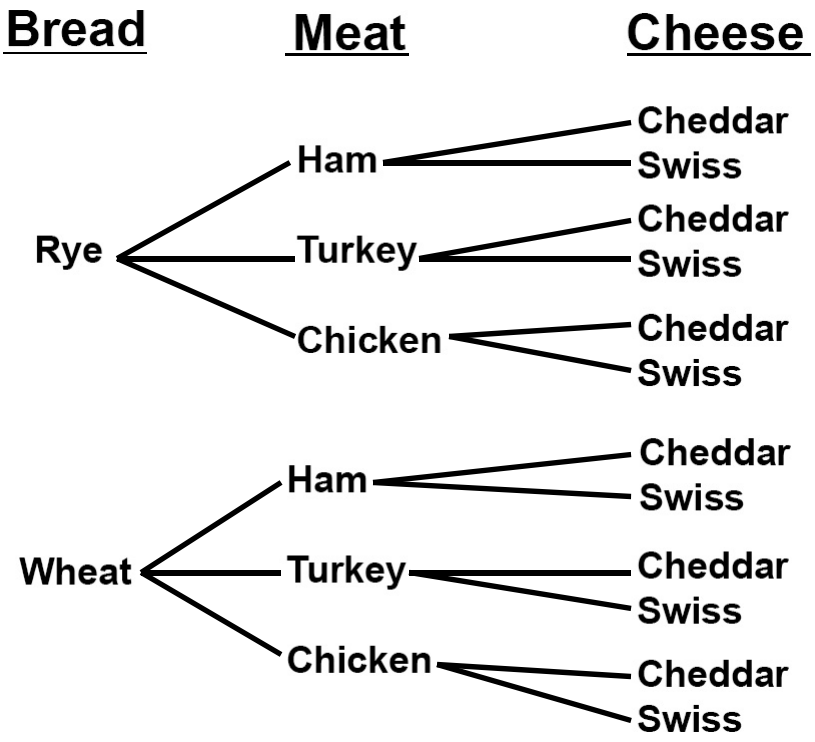
D. 

10. Mike and Joe are both plumbers. Mike charges an initial fee of $100 plus an hourly fee of $60. Joe charges an initial fee of $50 plus an hourly fee of $75. If Mike and Joe each have 3-hour jobs, who earns more money? How much more? Write an equation for each situation and show all work to justify your answer.

11. A deli prepares sandwiches with one type of bread (rye or wheat), one type of meat (ham, turkey, or chicken), and one type of cheese (cheddar or Swiss). Each combination is equally likely. Make a tree diagram to find the sample space for the compound event.

MATH 7A Practice Exam Answer Key

1. D
2. D
3. A
4. B
5. A
6. B
7. C
8. B
9. A
10. Mike will earn $5 more.
    Mike: $y = 100 + 60x$; $280 for 3 hr
    Joe: $y = 50 + 75x$; $275 for 3 hr
11. Answer should be a tree diagram with these options:



Texas Essential Knowledge and Skills
MATH 7A – Mathematics, Grade 7, First Semester

TTU: MATH 7A CBE, v.3.0		
TEKS: § 111.25. Mathematics, Grade 7		
TEKS Requirement (Secondary)	**Set A Question Numbers**	**Set B Question Numbers**
§111.25. Implementation of Texas Essential Knowledge and Skills for Mathematics, Middle School, Adopted 2012.		
(a) The provisions of §§111.26-111.28 of this subchapter shall be implemented by school districts.		
(b) No later than August 31, 2013, the commissioner of education shall determine whether instructional materials funding has been made available to Texas public schools for materials that cover the essential knowledge and skills for mathematics as adopted in §§111.26-111.28 of this subchapter.		
(c) If the commissioner makes the determination that instructional materials funding has been made available under subsection (b) of this section, §§111.26-111.28 of this subchapter shall be implemented beginning with the 2014-2015 school year and apply to the 2014-2015 and subsequent school years.		
(d) If the commissioner does not make the determination that instructional materials funding has been made available under subsection (b) of this section, the commissioner shall determine no later than August 31 of each subsequent school year whether instructional materials funding has been made available. If the commissioner determines that instructional materials funding has been made available, the commissioner shall notify the State Board of Education and school districts that §§111.26-111.28 of this subchapter shall be implemented for the following school year.		
(e) Sections 111.21-111.24 of this subchapter shall be superseded by the implementation of §§111.25-111.28 under this section.		
§111.27. Grade 7, 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 7 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, including number, geometry and measurement, and statistics and probability. 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;	3, 5, 6, 7, 9, 10, 18, 21	3, 5, 6, 7, 9, 10, 18, 21
(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;	3, 5, 7, 11, 12, 17, 20, 22	3, 5, 7, 11, 12, 17, 20, 22
(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;	3, 5, 8, 15, 16, 26, 27, 28, 29, 30, 31, 32, 33, 34	3, 5, 8, 15, 16, 26, 27, 28, 29, 30, 31, 32, 33, 34
(D) communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate;	12, 13, 23, 35	12, 13, 23, 35
(E) create and use representations to organize, record, and communicate mathematical ideas;	39	39
(F) analyze mathematical relationships to connect and communicate mathematical ideas; and	36, 38	36, 38
(G) display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.	37, 40	37, 40
(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 extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of rational numbers.	1, 37	1, 37
(3) Number and operations. The student applies mathematical process standards to add, subtract, multiply, and divide while solving problems and justifying solutions. The student is expected to:		
(A) add, subtract, multiply, and divide rational numbers fluently; and	2, 4, 8, 9	2, 4, 8, 9
(B) apply and extend previous understandings of operations to solve problems using addition, subtraction, multiplication, and division of rational numbers.	3, 5, 6, 7	3, 5, 6, 7
(4) Proportionality. The student applies mathematical process standards to represent and solve problems involving proportional relationships. The student is expected to:		
(A) represent constant rates of change in mathematical and real-world problems given pictorial, tabular, verbal, numeric, graphical, and algebraic representations, including d = rt;	13, 17	13, 17
(B) calculate unit rates from rates in mathematical and real-world problems;	15, 19, 22	15, 19, 22
(C) determine the constant of proportionality (k = y/x) within mathematical and real-world problems;	12, 23	12, 23
(D) solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems; and	10, 18, 21	10, 18, 21
(E) convert between measurement systems, including the use of proportions and the use of unit rates.	16, 24	16, 24
(5) Proportionality. The student applies mathematical process standards to use geometry to describe or solve problems involving proportional relationships. The student is expected to:		

(A) generalize the critical attributes of similarity, including ratios within and between similar shapes;	40	40
(B) describe π as the ratio of the circumference of a circle to its diameter; and	14, 25	14, 25
(C) solve mathematical and real-world problems involving similar shape and scale drawings.	11, 20	11, 20
(6) Proportionality. The student applies mathematical process standards to use probability and statistics to describe or solve problems involving proportional relationships. The student is expected to:		
(A) represent sample spaces for simple and compound events using lists and tree diagrams;	39	39
(B) select and use different simulations to represent simple and compound events with and without technology;		
(C) make predictions and determine solutions using experimental data for simple and compound events;	30, 33	30, 33
(D) make predictions and determine solutions using theoretical probability for simple and compound events;	27, 32	27, 32
(E) find the probabilities of a simple event and its complement and describe the relationship between the two;	29, 34	29, 34
(F) use data from a random sample to make inferences about a population;		
(G) solve problems using data represented in bar graphs, dot plots, and circle graphs, including part-to-whole and part-to-part comparisons and equivalents;		
(H) solve problems using qualitative and quantitative predictions and comparisons from simple experiments; and	26, 38	26, 38
(I) determine experimental and theoretical probabilities related to simple and compound events using data and sample spaces.	28, 31	28, 31
(7) Expressions, equations, and relationships. The student applies mathematical process standards to represent linear relationships using multiple representations. The student is expected to represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form $y = mx + b$.	35, 36	35, 36
(8) Expressions, equations, and relationships. The student applies mathematical process standards to develop geometric relationships with volume. The student is expected to:		
(A) model the relationship between the volume of a rectangular prism and a rectangular pyramid having both congruent bases and heights and connect that relationship to the formulas;		
(B) explain verbally and symbolically the relationship between the volume of a triangular prism and a triangular pyramid having both congruent bases and heights and connect that relationship to the formulas; and		
(C) use models to determine the approximate formulas for the circumference and area of a circle and connect the models to the actual formulas.		
(9) Expressions, equations, and relationships. The student applies mathematical process standards to solve geometric problems. The student is expected to:		
(A) solve problems involving the volume of rectangular prisms, triangular prisms, rectangular pyramids, and triangular pyramids;		
(B) determine the circumference and area of circles;		
(C) determine the area of composite figures containing combinations of rectangles, squares, parallelograms, trapezoids, triangles, semicircles, and quarter circles; and		
(D) solve problems involving the lateral and total surface area of a rectangular prism, rectangular pyramid, triangular prism, and triangular pyramid by determining the area of the shape's net.		
(10) Expressions, equations, and relationships. The student applies mathematical process standards to use one-variable equations and inequalities to represent situations. The student is expected to:		
(A) write one-variable, two-step equations and inequalities to represent constraints or conditions within problems;		
(B) represent solutions for one-variable, two-step equations and inequalities on number lines; and		
(C) write a corresponding real-world problem given a one-variable, two-step equation or inequality.		

(11) Expressions, equations, and relationships. The student applies mathematical process standards to solve one-variable equations and inequalities. The student is expected to:		
(A) model and solve one-variable, two-step equations and inequalities;		
(B) determine if the given value(s) make(s) one-variable, two-step equations and inequalities true; and		
(C) write and solve equations using geometry concepts, including the sum of the angles in a triangle, and angle relationships.		
(12) Measurement and data. The student applies mathematical process standards to use statistical representations to analyze data. The student is expected to:		
(A) compare two groups of numeric data using comparative dot plots or box plots by comparing their shapes, centers, and spreads;		
(B) use data from a random sample to make inferences about a population; and		
(C) compare two populations based on data in random samples from these populations, including informal comparative inferences about differences between the two populations.		
(13) 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) calculate the sales tax for a given purchase and calculate income tax for earned wages;		
(B) identify the components of a personal budget, including income; planned savings for college, retirement, and emergencies; taxes; and fixed and variable expenses, and calculate what percentage each category comprises of the total budget;		
(C) create and organize a financial assets and liabilities record and construct a net worth statement;		
(D) use a family budget estimator to determine the minimum household budget and average hourly wage needed for a family to meet its basic needs in the student's city or another large city nearby;		
(E) calculate and compare simple interest and compound interest earnings; and		
(F) analyze and compare monetary incentives, including sales, rebates, and coupons.		
Source: The provisions of this §111.27 adopted to be effective September 10, 2012, 37 TexReg 7109.		