Math 7 Examples

Utah Math 7 Core	Examples

Standard I: Students will expand number sense to understand, perform operations, and solve problems with rational numbers.
 	
Objective 1: Represent rational numbers in a variety of ways.
  a. Demonstrate multiple ways to represent whole numbers, decimals, fractions, percents, and integers using models and real-life examples.
  b. Simplify numerical expressions with whole number exponents using order of operations, and recognize that any positive number to the 0 power is 1.
  c. Represent numbers greater than one using scientific notation.
  d. Select the most appropriate form of a rational number for a given context.
	• Simplify: 2^3 x 3^2
	• Write 64,000 in scientific notation
	• Write 3X3X3X5X5 in exponential notation
	• One year it was estimated that 407,000,000 soccer balls were sold worldwide. What is this number in scientific notation?
	• Use a hundreds chart to demonstrate 45%
	• What is the simplest form of this expression? **$5(4^2 - 2) - 2^3$**

Objective 2: Compare and order rational numbers, including positive and negative fractions, positive and negative mixed numbers, and positive and negative decimals.
  a. Identify, read, and locate rational numbers on a number line.
  b. Compare pairs of rational numbers in different forms.
  c. Order rational numbers with and without a number line.
	• Order these numbers from least to greatest: 0.61, ½, 0.45, 2/5, ¼
	• Locate 9/5 on a number line.
	• Which is a better sale, 25% off or 1/3 off?
	• Rashid wants to label the lines on the board below at 1/2 foot, 1/3 foot, 3/8 foot, and 3/4 foot. In what order, from left to right should the lines be labeled?

Objective 3: Explain relationships and equivalences among rational numbers.
  a. Find equivalent forms for common fractions, decimals, percents, and ratios, including repeating or terminating decimals.
  b. Predict the effect of operating with fractions, decimals, percents, and integers as an increase or a decrease of the original value.
  c. Recognize and use the identity properties of addition and
	• Will the quotient of $436 \div 2,163$ be greater than, less than, or equal to1?
	• The sum of 9/4 and 2/3 is between which two whole numbers?
	• Which value of *n* makes this equation true?
	
	6 x 3 x *n* = 6

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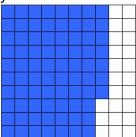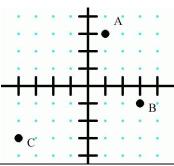|	
multiplication, the multiplicative property of zero, the commutative and associative properties of addition and multiplication, and the distributive property of multiplication over addition. d. Recognize and use the inverse operations of adding and subtracting a fixed number, multiplying and dividing by a fixed number, and computing squares of whole numbers and taking square roots of perfect squares.	• Simplify 6(3+y)
Objective 4: Model meanings of ratios and operations with rational numbers. a. Demonstrate that the fraction $\dfrac{a}{b}$ represents *a divided by b*. b. Recognize percents as ratios based on 100 and decimals as ratios based on powers of 10. c. Extend the multiplication of whole numbers to multiplication of fractions using area models, measurement models, and the number line. d. Compare the division of whole numbers to the division of fractions using area or set models, the number line, and missing factors.	• Simplify $\dfrac{25}{5}$. • Write 33% as a fraction. • Demonstrate $\dfrac{2}{3} \times \dfrac{1}{2}$ using an area model. • What part of the model is shaded? Express your answer as a decimal and as a percent.
Objective 5: Solve problems involving rational numbers. a. Compute fluently using all four operations with integers and positive fractions and decimals. b. Solve problems using factors, multiples, prime factorization, relatively prime numbers, and common divisibility rules. c. Solve application problems involving rational numbers. d. Determine if an answer is reasonable using estimation.	• $\dfrac{-45}{9}$ • Gina cuts a piece of wood that is 3 1/2 feet long from a board that is 5 2/3 feet long. How long is the piece of board that is left over? • Each art projects requires 3/8 of a yard of string. How many projects can be made with 6 yards of string? • What do 1,3,9,27 all have in common?

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Standard II: Students will use proportional reasoning to solve problems.
Objective 1: Solve problems involving ratios, rates, proportions and percentages.
  a. Solve ratio and rate problems using informal methods involving multiplication and division.
  b. Solve percent problems using ratio and proportion, including problems involving discounts, interest, taxes, tips, and percent increase or decrease.
  c. Solve problems involving proportions, rates, and measures.
	• Lunch for 5 people costs $54.85. What is a reasonable estimate for the bill plus a 15 percent tip?
	• Irene gets 2% interest on the balance in her checking account at the end of each month. This month, her balance was $200. How much money will she earn in interest by the end of the month?
	• If John can travel 110 miles in 2 hours, how far can he travel in 4 hours? In 5 hours? In 6 hours?

Objective 2: Apply the properties of proportionality to different units of measurement.
  a. Convert from one unit of measurement to an equivalent unit of measurement in the same system using a given conversion factor.
  b. Understand that in a proportional relationship, all dimensions change by the same scale factor.
  c. Create and interpret scale drawings and approximate distance on maps using proportions.
	• How many yards are in 3 miles?
	• Eric's car is 4.6 meters long. How long is it in centimeters?
	• A right triangle has legs 3 in. and 5 in. If a similar right triangle has one leg of 27 in., what is the length of the other leg?
	• Approximate the distance from St. George to Moab using a map.

Standard III: Students will develop fluency with the language and operations of algebra to analyze and represent relationships.
 	
Objective 1: Evaluate, simplify, and solve algebraic expressions and equations.
  a. Write a variable expression to identify pattern relationships, and use those expressions to make predictions.
  b. Translate verbal expressions into algebraic expressions.
  c. Simplify and evaluate algebraic expressions.
  d. Show that performing the same operation on both sides of an equation will produce an equivalent equation.
  e. Solve single-variable linear equations and inequalities of the form $ax + b = c$, $ax + b < c$, or $ax + b > c$.
	• A phone company charges a basic fee of $4.50 a month. The company also charges 7 **cents** per minute. Write an expression that shows the total monthly bill.
	• Evaluate **3(x + 2y)** if $x = 3$ and $y = 5$
	• Solve 3m - 5 = 196
	• If $\square\ \square\ \bigcirc\ \bigcirc\ \bigcirc$ represents $2x + 3$,
	   then $\square\ \square\ \square\ \square\ \bigcirc$ represents:

Objective 2: Represent relationships using graphs, tables, and other models.	• An architect is designing a parking lot. He

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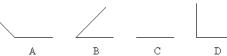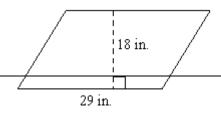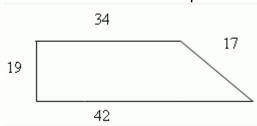|	
a. Identify integer coordinates when given the graph of a point on a rectangular coordinate system. b. Graph ordered pairs of integers on a rectangular coordinate system. c. Model real-world problems using graphs, tables, equations, manipulatives, and pictures.	uses the center of the lot as the origin, and puts lights at (-3, -2), (0, 5), (5, 1), and (1, -5). Draw a graph showing where these lights would go. • What are the coordinates in the graph?
Standard IV: Students will use algebraic, spatial, and logical reasoning to solve geometry and measurement problems. **Objective 1: Draw, label, and describe attributes of geometric figures to determine geometric relationships.** a. Draw, label, and describe relationships among line segments, rays, lines, parallel lines, and perpendicular lines, including midpoint of a line segment. b. Draw, label, and describe relationships among vertical, adjacent, complementary, and supplementary angles. c. Draw, label, and describe attributes of angles, triangles, and quadrilaterals.	• Classify the angles below: A B C D • Draw a scalene triangle. • Describe the relationship between supplementary angles.
Objective 2: Determine measurements in metric and customary units using appropriate tools and formulas. a. Estimate metric and customary measures using everyday objects and comparisons. b. Measure length, area, volume, and angles to appropriate levels of precision. c. Calculate the measurement of everyday objects using formulas for perimeters and areas of triangles and quadrilaterals, and circumferences and areas of circles. d. Calculate the measurement of everyday objects using formulas for surface area and volume of right triangular and rectangular	• Ben had a piece of heavy wire 40 inches long. He bent it into the shape of a square. Ben wants to fit a piece of glass into the square. How much glass will Ben need? • What is the area of the parallelogram? 18 in. 29 in.

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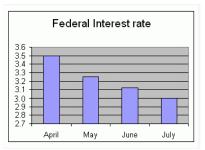|	

prisms and cylinders.	• Find the area of the trapezoid
	
	    34
	               17
	 19
	
	    42

Standard V: Students will understand concepts from probability and statistics and apply statistical methods to solve problems.
 	
Objective 1: Use basic concepts of probability to determine the likelihood of an event and compare the results of various experiments.
   a. Write the results of a probability experiment as a fraction, ratio, or decimal, between zero and one, or as a percent between zero and one hundred, inclusive.
   b. Compare experimental results with theoretical probability.
   c. Compare individual, small group, and large group results of a probability experiment.
	• Flip a coin 50 times and record the number of heads. Write the experimental results as a fraction and as a percent?
	• Ms. Anderson divided the class into groups of four with the instructions to roll a die 25 times each. Individual results are added together for a group result. Then group results are added for a class result. Why would a number on the dice only show up twice for Tony but be the highest number for both Tony's group and the class?

Objective 2: Display and compare data to make predictions and formulate conclusions.
   a. Display data using tables, scatter plots, and circle graphs.
   b. Compare two similar sets of data on the same graph.
   c. Compare two different kinds of graphs representing the same set of data.
   d. Propose and justify inferences and predictions based on data.
	• What can Jedd predict from the graph?
	
	Federal Interest rate
	3.6
	3.5
	3.4
	3.3
	3.2
	3.1
	3.0
	2.9
	2.8
	2.7
	  April May June July
	
	• The comparison line graph compares rainfall, in

	centimeters, in Sydney and Canberra in March 1993. What is the difference in rainfall on March 3?
	March Rain