

College Readiness Standards — Mathematics

	Basic Operations & Applications	Probability, Statistics, & Data Analysis	Numbers: Concepts & Properties	Expressions, Equations, & Inequalities
13–15 200	Perform one-operation computation with whole numbers and decimals Solve problems in one or two steps using whole numbers Perform common conversions (e.g., inches to feet or hours to minutes)	Calculate the average of a list of positive whole numbers Perform a single computation using information from a table or chart	Recognize equivalent fractions and fractions in lowest terms	Exhibit knowledge of basic expressions (e.g., identify an expression for a total as $b + g$) Solve equations in the form $x + a = b$, where a and b are whole numbers or decimals
16–19 300	Solve routine one-step arithmetic problems (using whole numbers, fractions, and decimals) such as single step percent Solve some routine two-step arithmetic problems	Calculate the average of a list of numbers Calculate the average, given the number of data values and the sum of the data values Read tables and graphs Perform computations on data from tables and graphs Use the relationship between the probability of an event and the probability of its complement	Recognize one-digit factors of a number Identify a digit's place value *Apply a definition of an operation for whole numbers (e.g., $a @ b = 3a - b$)	Substitute whole numbers for unknown quantities to evaluate expressions Solve one-step equations having integer or decimal answers Combine like terms (e.g., $2x + 5x$)
20–23 400	Solve routine two-step or three-step arithmetic problems involving concepts such as rate and proportion, tax added, percentage off, and computing with a given average	Calculate the missing data value, given the average and all data values but one Translate from one representation of data to another (e.g., a bar graph to a circle graph) Determine the probability of a simple event Exhibit knowledge of simple counting techniques*	Exhibit knowledge of elementary number concepts including rounding, the ordering of decimals, pattern identification, primes, and greatest common factor *Write positive powers of 10 by using exponents *Understand absolute value in terms of distance *Add two matrices that have whole number entries	Evaluate algebraic expressions by substituting integers for unknown quantities Add and subtract simple algebraic expressions Solve routine first-degree equations Perform straightforward word-to-symbol translations Multiply two binomials*
24–27 500	Solve multistep arithmetic problems that involve planning or converting units of measure (e.g., feet per second to miles per hour)	Calculate the average, given the frequency counts of all the data values Manipulate data from tables and graphs Compute straightforward probabilities for common situations Use Venn diagrams in counting* *Recognize that when data summaries are reported in the real world, results are often rounded and must be interpreted as having appropriate precision *Recognize that when a statistical model is used, model values typically differ from actual values	Find and use the least common multiple Order fractions Work with numerical factors Work with scientific notation Work with squares and square roots of numbers Work problems involving positive integer exponents* Work with cubes and cube roots of numbers* Determine when an expression is undefined* Exhibit some knowledge of the complex numbers† *Add and subtract matrices that have integer entries	Solve real-world problems using first degree equations Write expressions, equations, or inequalities with a single variable for common pre-algebra settings (e.g., rate and distance problems and problems that can be solved by using proportions) Identify solutions to simple quadratic equations Add, subtract, and multiply polynomials* Factor simple quadratics (e.g., the difference of squares and perfect square trinomials)* Solve first-degree inequalities that do not require reversing the inequality sign*
28–32 * 600	Solve word problems containing several rates, proportions, or percentages	Calculate or use a weighted average Interpret and use information from figures, tables, and graphs Apply counting techniques Compute a probability when the event and/or sample space are not given or obvious *Recognize the concepts of conditional and joint probability expressed in real-world contexts *Recognize the concept of independence expressed in real-world contexts	Apply number properties involving prime factorization Apply number properties involving even/odd numbers and factors/multiples Apply number properties involving positive/negative numbers Apply rules of exponents Multiply two complex numbers† *Apply properties of rational exponents *Use relations involving adding, subtracting, and scalar multiplication of vectors and of matrices	Manipulate expressions and equations Write expressions, equations, and inequalities for common algebra settings Solve linear inequalities that require reversing the inequality sign Solve absolute value equations Solve quadratic equations Find solutions to systems of linear equations *Build functions for relations that are inversely proportional *Find a recursive expression for the general term in a sequence described recursively
33–36 † 700	Solve complex arithmetic problems involving percent of increase or decrease and problems requiring integration of several concepts from pre-algebra and/or pre-geometry (e.g., comparing percentages or averages, using several ratios, and finding ratios in geometry settings)	Distinguish between mean, median, and mode for a list of numbers Analyze and draw conclusions based on information from figures, tables, and graphs Exhibit knowledge of conditional and joint probability *Understand the role of randomization in surveys, experiments, and observational studies *Recognize that part of the power of statistical modeling comes from looking at regularity in the differences between actual values and model values	Draw conclusions based on number concepts, algebraic properties, and/or relationships between expressions and numbers Exhibit knowledge of logarithms Find a recursive expression for the general term in a sequence described recursively Apply properties of complex numbers *Multiply matrices *Apply properties of matrices and properties of matrices as a number system	Write expressions that require planning and/or manipulating to accurately model a situation Write equations and inequalities that require planning, manipulating, and/or solving Solve simple absolute value inequalities *Apply the remainder theorem for polynomials, that $P(a)$ is the remainder when $P(x)$ is divided by $(x-a)$

College Readiness Standards — Mathematics (continued)

	Graphical Representations	Properties of Plane Figures	Measurement	Functions†
13–15 200	<p>*Locate positive rational numbers (expressed as whole numbers, fractions, decimals, and mixed numbers) on a number line</p> <p>*Calculate the length of a line segment based on the lengths of other line segments that go in the same direction (e.g., overlapping line segments and parallel sides of polygons with only right angles)</p>		<p>Estimate or calculate the length of a line segment based on other lengths given on a geometric figure</p>	<p>*Extend a given pattern by a few terms that have a constant increase or decrease between terms</p>
16–19 300	<p>Locate points on the number line and in the first quadrant</p> <p>*Relate a graph to a situation described qualitatively in terms of familiar properties such as before and after, increasing and decreasing, higher and lower</p>	<p>Exhibit some knowledge of the angles associated with parallel lines</p>	<p>Compute the perimeter of polygons when all side lengths are given</p> <p>Compute the area of rectangles when whole number dimensions are given</p>	<p>*Extend a given pattern by a few terms for patterns that have a constant factor between terms</p>
20–23 400	<p>Locate points in the coordinate plane</p> <p>Comprehend the concept of length on the number line*</p> <p>Exhibit knowledge of slope*</p> <p>*Find the distance in the coordinate plane between two points with the same x-coordinate or y-coordinate</p> <p>*Relate a graph to a situation described in terms of starting value and an additional amount per unit (e.g., unit cost, weekly growth)</p> <p>*Translate points up, down, left, and right in the coordinate plane</p>	<p>Find the measure of an angle using properties of parallel lines</p> <p>Exhibit knowledge of basic angle properties and special sums of angle measures (e.g., 90°, 180°, and 360°)</p>	<p>Compute the area and perimeter of triangles and rectangles in simple problems</p> <p>Use geometric formulas when all necessary information is given</p>	<p>Evaluate quadratic functions, expressed in function notation, at integer values</p>
24–27 500	<p>Identify the graph of a linear inequality on the number line*</p> <p>Determine the slope of a line from points or equations*</p> <p>Match linear graphs with their equations*</p> <p>Find the midpoint of a line segment*</p> <p>*Find the coordinates of a point rotated 180° around a given center point</p>	<p>Use several angle properties to find an unknown angle measure</p> <p>Recognize Pythagorean triples*</p> <p>Use properties of isosceles triangles*</p> <p>*Count the number of lines of symmetry of a geometric figure</p>	<p>Compute the area of triangles and rectangles when one or more additional simple steps are required</p> <p>Compute the area and circumference of circles after identifying necessary information</p> <p>Compute the perimeter of simple composite geometric figures with unknown side lengths*</p>	<p>Evaluate polynomial functions, expressed in function notation, at integer values</p> <p>Express the sine, cosine, and tangent of an angle in a right triangle as a ratio of given side lengths</p> <p>*Find the next term in a sequence described recursively</p> <p>*Build functions and use quantitative information to identify graphs for relations that are proportional or linear</p> <p>*Understand the concept of domain and range in terms of valid input and output, and in terms of function graphs</p> <p>*Interpret statements that use function notation in terms of their context</p> <p>*Use function notation for simple functions of two variables</p>
28–32 * 600	<p>Interpret and use information from graphs in the coordinate plane</p> <p>Match number line graphs with solution sets of linear inequalities</p> <p>Use the distance formula</p> <p>Use properties of parallel and perpendicular lines to determine an equation of a line or coordinates of a point</p> <p>Recognize special characteristics of parabolas and circles (e.g., the vertex of a parabola and the center or radius of a circle)†</p> <p>*Given an equation or function, find an equation or function whose graph is a translation by a specified amount up or down</p> <p>*Relate a graph to a situation described qualitatively in terms of faster and slower change</p> <p>*Find the coordinates of a point reflected across a vertical or horizontal line or across $y = x$</p> <p>*Find the coordinates of a point rotated 90° about the origin</p>	<p>Apply properties of 30°-60°-90°, 45°-45°-90°, similar, and congruent triangles</p> <p>Use the Pythagorean theorem</p>	<p>Use relationships involving area, perimeter, and volume of geometric figures to compute another measure</p>	<p>Evaluate composite functions at integer values</p> <p>Apply basic trigonometric ratios to solve right-triangle problems</p> <p>*Find the domain of polynomial functions and rational functions</p> <p>*Find the range of polynomial functions</p> <p>*Find where a rational function's graph has a vertical asymptote</p>
33–36 † 700	<p>Match number line graphs with solution sets of simple quadratic inequalities</p> <p>Identify characteristics of graphs based on a set of conditions or on a general equation such as $y = ax^2 + c$</p> <p>Solve problems integrating multiple algebraic and/or geometric concepts</p> <p>Analyze and draw conclusions based on information from graphs in the coordinate plane</p> <p>*Match graphs of basic trigonometric functions with their equations</p> <p>*Given an equation or function, find an equation or function whose graph is a translation by specified amounts in the horizontal and vertical directions</p>	<p>Draw conclusions based on a set of conditions</p> <p>Solve multistep geometry problems that involve integrating concepts, planning, visualization, and/or making connections with other content areas</p> <p>Use relationships among angles, arcs, and distances in a circle</p>	<p>Use scale factors to determine the magnitude of a size change</p> <p>Compute the area of composite geometric figures when planning or visualization is required</p>	<p>Write an expression for the composite of two simple functions</p> <p>Use trigonometric concepts and basic identities to solve problems</p> <p>Exhibit knowledge of unit circle trigonometry</p> <p>Match graphs of basic trigonometric functions with their equations</p> <p>*Compare actual values and the values of a modeling function to judge model fit and compare models</p> <p>*Build functions for relations that are exponential</p>

*Statements apply to PLAN & ACT only

BOA 401 – Percents - Assessment

	Standard	Description
Focus	BOA 401	Solve routine two-step or three-step arithmetic problems involving concepts such as rate and proportion, tax added, percentage off, and computing with a given average

180° Skills

1. Solve the following percent problems.

a. 24 is what percent of 40?

b. 9 is 45% of what number?

360° Skills

1. A number decreased by 20% is 48. What is the original number?

2. In Wisconsin the cost to register a vehicle increased from \$75 to \$95. What was the percent increase?

3. In 2016 Oscar's Manufacturing employed 250 people. In 2017 the number of employees increased by 18%. How many employees did Oscar's Manufacturing have in 2017?

4. Last year the average selling price of a home sold by Ronnie's Real Estate was \$180,000. This year Ronnie's average selling price is \$160,000. What is the percent decrease in average selling price from last year?

5. At the Cool Clothing Store Jared is going to purchase two pairs of pants that are \$30 each and two shirts that are \$15 each. The store currently has a sale of 30% off. If there is a 5% sales tax, what is Jared's total bill?

6. The Downtown High School girl's volleyball team continues to make improvement each year. Listed below is the team record over the past four years.

Year	Wins	Losses
2014	7	22
2015	12	18
2016	20	8
2017	x	4

If the volleyball team had a 30% increase in wins from 2016 to 2017, how many victories did they have in 2017?

MEA 503 – Composite Geometric Figures Assessment

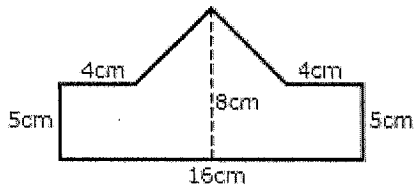
	Standard	Description
Focus	MEA 503	Compute the perimeter of simple composite geometric figures with unknown side lengths

180° Skills

- If a triangle has a base of 3 cm and a height of 9 cm, what is the area of the triangle?

360° Skills

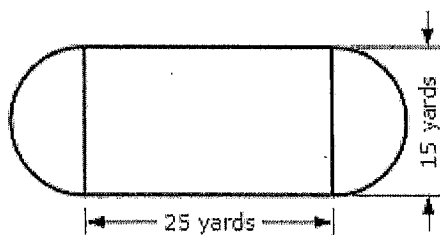
- Find the area and perimeter of the shape below.



Area = _____

Perimeter = _____

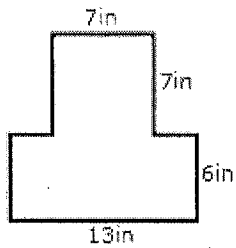
- Find the area and perimeter of the shape below.



Area = _____

Perimeter = _____

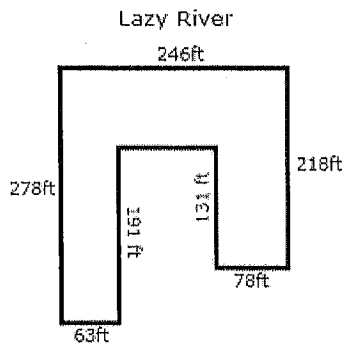
3. Find the area and perimeter of the shape below.



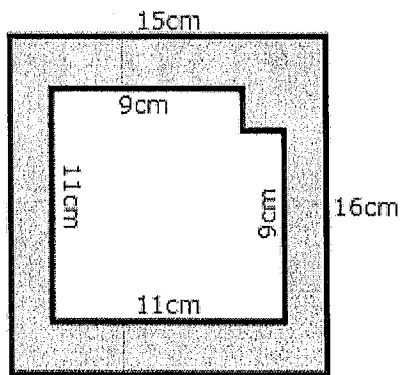
Area = _____

Perimeter = _____

4. A local water park needs to add a hard cover to the top of the Lazy River attraction to keep insurance costs low. If the cover costs \$60,000 to install, how much did it cost per square foot?



5. Find the area that lies between the outer rectangle and the inside polygon.



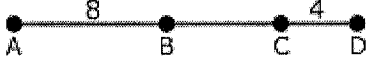
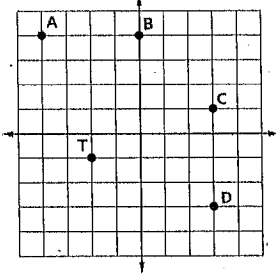
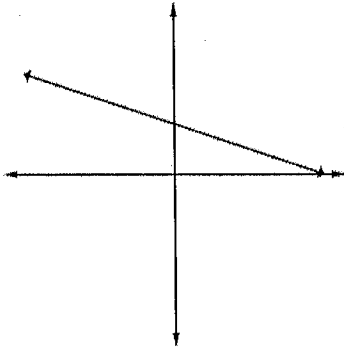
1.	BOA 401	<p>My real estate agent told me that Tom that his house had appreciated in value over the last three years. The house has gone from being worth \$102,500 to being worth \$111,000. What is the percent increase in the value of my house?</p> <p>A. 8.29% B. 2.76% C. 7.66% D. 4.75% E. None of the above</p>
2.	BOA 401	<p>Charlie bought a pair of pants that is 20% off. If the original price of the pants is \$40 and there is a 5% sales tax. How much change will Charlie get back if he has a fifty -dollar bill?</p> <p>A. \$16.40 B. \$33.60 C. \$8.80 D. \$2 E. \$25</p>
3.	BOA 401R	<p>That ratio of boys to girls in the daycare are 2:3. If there are 30 students in the daycare, how many are girls?</p> <p>A. 10 B. 6 C. 15 D. 12 E. 18</p>
4.	PSD 401	<p>Janel went fishing in Lake Trout and caught four fish that had an average weight of 3.4 pounds. One of the fish fell back into the water when she was transporting them to her bucket. The three remaining fish have weights of 2.8 pounds, 3.6 pounds, and 3.3 pounds. What is the weight of the fish that fell out of the boat?</p> <p>A. 4.2 B. 4.0 C. 3.9 D. 3.7 E. 3.4</p>

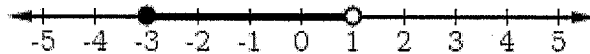
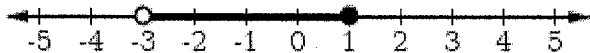

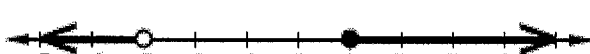

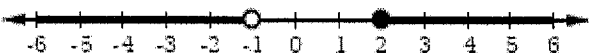
5.	PSD 404	How many different arrangements are there for the letters of the word EXAM? A. 10 B. 12 C. 24 D. 30 E. 36
6.	PSD 404	Harold is planning to add some items to his wardrobe. Currently, Harold has 2 pairs of shoes, 2 pairs of pants, and 3 shirts. Harold goes shopping and adds 1 pair of shoes, 1 pair of pants, and 2 new shirts. If an outfit consists of 1 pair of shoes, 1 pair of pants, and 1 shirt, how many more outfits can Harold make after he went shopping? - A. 12 B. 45 C. 33 D. 4 E. 11
7.	NCP 401	$ 4(-3) + 2 = ?$ A. -10 B. 10 C. 4 D. 14 E. -14
8.	NCP 401 GCF	What is the greatest common factor of 24, 54 and 72? A. 6 B. 9 C. 12 D. 16 E. 24
9.	NCP 401 GCF	Which of the following is equivalent to $6x^3 - 3x^2$? A. $3x^2(2x)$ B. $3x^2(3x - 1)$ C. $3x^2(2x - 1)$ D. $3x^2(2x^2 - x)$ E. $3x^2(3x)$

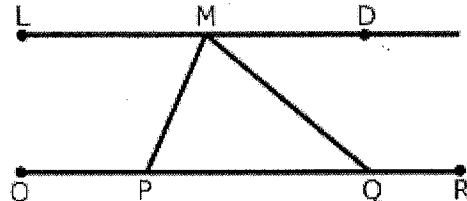
10.	XEI 401	<p>What is the value of $y^2 - 2x - yx$ if $x = 3$ and $y = -1$?</p> <p>A. -10 B. -4 C. -2 D. -8 E. None of the above</p>
11.	XEI 401	<p>If $x = -6$, then $-x^2 - 2x + 21 = ?$</p> <p>A. -27 B. -3 C. 21 D. 45 E. 69</p>
12.	XEI 402	<p>Which of the following expressions is equivalent to $5(n - 3) - 2(n - 4)$?</p> <p>A. $7n - 23$ B. $3n - 23$ C. $3n - 7$ D. $7n - 7$ E. $3n + 23$</p>
13.	XEI 403	<p>If $\frac{3}{5}t - \frac{1}{2}t = 8$, the $t = ?$</p> <p>A. 80 B. 12 C. 400 D. $\frac{40}{3}$ E. 4</p>
14.	XEI 403	<p>If $2(x - 3) = 10$, then $3x = ?$</p> <p>A. 2 B. 6 C. 8 D. 24 E. 32</p>

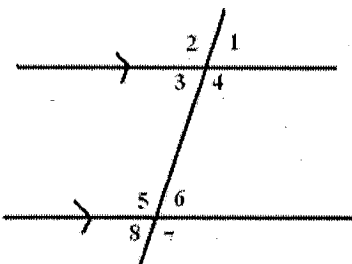
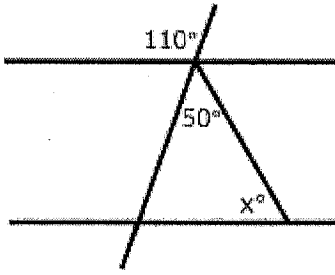
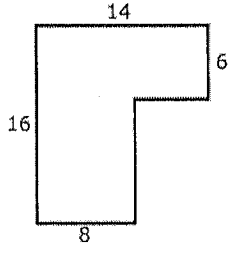
15.	XEI 404	<p>Which of the following algebraic equations represents the following statement?</p> <p>The product of a number and 3 subtracted from 9 is 21 less than the number.</p> <p>A. $3x - 9 = 21 - x$ B. $3x - 9 = x - 21$ C. $9 - 3x = x - 21$ D. $9 - 3x = 21 - x$ E. $3x - 9 = x + 21$</p>
16.	XEI 405	<p>For all x, which of the following expressions is equivalent to $(3a-2)^2$?</p> <p>A. $6a^2 + 4$ B. $9a^2 - 4$ C. $9a^2 + 4$ D. $9a^2 - 4a + 4$ E. $9a^2 - 12a + 4$</p>
17.	XEI 405	<p>For all x, which of the following expressions is equivalent to $(3t+4)(t-6)$?</p> <p>A. $3t^2 - 24$ B. $3t^2 - 14t - 24$ C. $3t^2 - 2t - 24$ D. $4t - 2$ E. $3t^2 + 6t - 24$</p>
18.	XEI 503	<p>What values of x are solutions to $x^2 - 5x + 6 = 0$?</p> <p>A. -6 and 1 B. -3 and -2 C. -1 and 1 D. 3 and 2 E. 6 and -1</p>

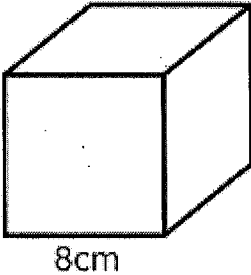
19.	XEI 501/501	<p>Javier drove to his vacation home which was located 320 miles away. If he drove at an average speed of 50 miles per hour, which of the following represents the time t he spend driving to his vacation home?</p> <p>A. $t = (320)(50)$ B. $t = 320 + 50$ C. $t = \frac{320}{50}$ D. $t = \frac{320 - 50}{2}$ E. $t = \frac{50}{320}$</p>
20.	XEI 504	<p>For all x, $(4x^3 + 3x^2 - 7) - (5x^2 - 8x + 6) = ?$</p> <p>A. $4x^3 - 2x^2 - 8x - 1$ B. $4x^3 - 2x^2 + 8x - 13$ C. $4x^3 - 2x^2 - 8x + 13$ D. $-x^3 + 11x^2 - 1$ E. $-x^3 - 5x^2 - 1$</p>
21.	XEI 504	<p>For all x, $(x^2 + 2x - 5)(x + 3)$ is equivalent to which of the following?</p> <p>A. $x^3 + 5x^2 + x - 15$ B. $x^3 + 5x^2 + x + 15$ C. $x^3 + 5x^2 + 11x - 15$ D. $x^3 + 6x^2 + x - 15$ E. Answer is not given</p>
22.	XEI 505	<p>If $x - 5$ is a factor of $x^2 - 8x + c$, what is the value of c?</p> <p>A. -8 B. -3 C. 5 D. 8 E. 15</p>
23.	XEI 505	<p>Which of the following expressions is equivalent to $3a^2 + 10a - 8$?</p> <p>A. $(3a - 4)(a + 2)$ B. $(3a + 2)(a - 4)$ C. $(3a - 2)(a + 4)$ D. $(3a + 4)(a - 2)$ E. $(3a - 4)(a - 2)$</p>

24.	GRE 401	<p>If a coordinate is in Quadrant II, which of the following must be true?</p> <p>I. x is positive II. x is negative III. y is positive IV. y is negative</p> <p>A. I and III only B. II and III only C. I and IV only D. II and IV only E. None of the above</p>
25.	GRE 402	<p>If the length of \overline{AD} is 18, what is the length of \overline{BC} ?</p> <p>A. 6 B. 5 C. 7 D. 2 E. 10</p> 
26.	GRE 403	<p>A line through point T with a slope of $\frac{2}{5}$ intersects with which of the following points?</p> <p>A. Point A B. Point B C. Point C D. Point D</p> 
27.	GRE 403	<p>Which of the following is the best estimate for the slope of the following graph?</p> <p>A. 3 B. -3 C. $\frac{1}{3}$ D. $-\frac{1}{3}$ E. 0</p> 

28.	GRE 403	<p>Which of the following equations is parallel to $y=3-\frac{1}{2}x$?</p> <p>A. $y=\frac{1}{2}x-3$</p> <p>B. $y=3x-\frac{1}{2}$</p> <p>C. $y=-2x+3$</p> <p>D. $y=2x-3$</p> <p>E. $y=-\frac{1}{2}x+5$</p>
29.	GRE 501	<p>Which of the following represents $-3 \leq x < 1$?</p> <p>A. </p> <p>B. </p> <p>C. </p> <p>D. </p> <p>E. </p>
30.	GRE 501	<p>Which of the following inequalities represents the graph below?</p>  <p>A. $x < -1$ and $x \geq 2$</p> <p>B. $-1 < x \leq 2$</p> <p>C. $x < -1$ or $x \geq 2$</p> <p>D. $-1 \leq x < 2$</p> <p>E. $x \leq -1$ or $x > 2$</p>
31.	GRE 502	<p>What is the slope of a line that passes through the points: $(-2, 15)$ and $(3, 5)$</p> <p>A. -10</p> <p>B. $-\frac{1}{2}$</p> <p>C. -2</p> <p>D. 2</p> <p>E. 10</p>

32.	GRE 502	<p>What is the slope of the equation $6x - 3y = 12$?</p> <p>A. -2 B. 2 C. 6 D. -3 E. $\frac{1}{2}$</p>
33.	GRE 503	<p>What is the y-intercept of the line that travels through points $(-4, 5)$ and $(3, -9)$?</p> <p>A. -3 B. -4 C. -5 D. 1 E. 2</p>
34.	GRE 503	<p>In a coordinate plane, which of the following are located on the graph of $2x - 3y = 6$?</p> <p>I. $(3, 2)$ II. $(9, 4)$ III. $(0, 3)$</p> <p>A. I only B. II only C. III only D. I and II only E. All of them</p>
35.	PPF 401	<p>For the following diagram, segment \overline{LD} is parallel to \overline{OR}. The measure of $\angle MPO$ is 115° and the measure of $\angle DMQ$ is 40°. If it can be determined, what is the measure of $\angle PMQ$?</p>  <p>A. 40° B. 65° C. 75° D. 50° E. Cannot be determined</p>

36.	PPF 401	<p>Using the diagram below, which of the following represents corresponding angles?</p>  <p>A. $\angle 1$ and $\angle 8$ B. $\angle 2$ and $\angle 6$ C. $\angle 4$ and $\angle 7$ D. $\angle 7$ and $\angle 1$ E. $\angle 5$ and $\angle 3$</p>
37.	PPF 402	<p>Given the following diagram with parallel lines, what is the degree measure of x?</p>  <p>A. 60° B. 20° C. 70° D. 50° E. 40°</p>
38.	MEA 401	<p>What is the area of the diagram?</p>  <p>A. 212 B. 164 C. 60 D. 44 E. 224</p>

39.	MEA 402	<p>What is the surface area of the cube below?</p> <p>A. 64 B. 512 C. 32 D. 256 E. 384</p>	 <p style="text-align: center;">8cm</p>														
40.	FUN 401	<p>Let $f(x)$ be defined as the table on the right. If $f(a) = 5$, then what is $2a$?</p> <p>A. 6 B. 3 C. 1 D. 2 E. 0</p>	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>x</th> <th>$f(x)$</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>2</td> </tr> <tr> <td>1</td> <td>3</td> </tr> <tr> <td>2</td> <td>4</td> </tr> <tr> <td>3</td> <td>5</td> </tr> <tr> <td>4</td> <td>0</td> </tr> <tr> <td>5</td> <td>1</td> </tr> </tbody> </table>	x	$f(x)$	0	2	1	3	2	4	3	5	4	0	5	1
x	$f(x)$																
0	2																
1	3																
2	4																
3	5																
4	0																
5	1																
41.	FUN 401	<p>If $f(x) = x^2 - 2x$, then what is $f(6) - f(3)$?</p> <p>A. 0 B. 21 C. 12 D. 4 E. 3</p>															

Name: _____

Solving Linear Equations
SLOT 1

1. $x + 8 = 6$

5. $15 = m - 5$

2. $n - 5 = 10$

6. $12 + k = 7$

3. $6 = t + 12$

7. $8 = -5 + v$

4. $-5 + p = -12$

8. $-7 = -8 + b$

Solving Linear Equations
SLOT 2

1. $3x = 9$

5. $15 = -5t$

2. $4n = 22$

6. $12k = -36$

3. $24 = 7t$

7. $-8v = -20$

4. $-6p = 18$

8. $-b = 28$

Solving Linear Equations
SLOT 3

1. $-3x - 12 = 15$

5. $3t + 16 = 14$

2. $5n + 14 = 20$

6. $-12k + 8 = -16$

3. $-3t - 4 = -13$

7. $10v - 11 = 13$

4. $8p - 2 = 24$

8. $14b - 20 = 0$

Solving Linear Equations
SLOT 4

1. $12 - 3x = 15$

5. $15 = 12 - 7t$

2. $25 + 4n = 12$

6. $-17 = 12 + 6k$

3. $-15 - 6t = -22$

7. $92 = 36 + 24v$

4. $33 + 2p = -13$

8. $0 = 33 - 11b$

Solving Linear Equations
SLOT 5

1. $\frac{x}{6} = -5$

4. $\frac{t}{7} = 8$

2. $\frac{n}{-4} = 11$

5. $\frac{k}{-3} = 7$

3. $\frac{t}{5} = 8$

6. $-7 = \frac{v}{2}$

Solving Linear Equations
SLOT 6

1. $\frac{2x}{3} - 15 = -5$

4. $\frac{t}{7} + 4 = 9$

2. $\frac{n}{-4} + 2 = 11$

5. $3 - \frac{2k}{3} = 7$

3. $-3 - \frac{p}{5} = 8$

6. $-7 = 2 - \frac{3v}{2}$

Solving Linear Equations
SLOT 7

1. $\frac{6x-4}{4} = -5$

5. $\frac{3t+2}{7} = -9$

2. $\frac{-2n-2}{-4} = -11$

6. $\frac{3-2k}{-3} = 7$

3. $\frac{t+2}{5} = 8$

7. $-7 = \frac{8v+2}{2}$

4. $3 = \frac{4-5p}{2}$

8. $\frac{6b-7}{4} = 11$

Solving Linear Equations
SLOT 8

1. $3x - 5 = 5x + 7$

5. $6t - 8 = 6t + 4$

2. $6n - 5 = 3n$

6. $-k + 6 = 4k - 8$

3. $5t - 4 = -8t + 6$

7. $-2v - 11 = -3v$

4. $-9p + 8 = -2p - 5$

8. $-5b + 12 = -5b - 11$

Solving Linear Equations
SLOT 9

1. $4(x-3) = 7(x+6)$

4. $4(2t-3) = 6(2t+4)$

2. $-3(n-4) = -5(3n+5)$

5. $-4(3n+1) = 8n-1$

3. $-(3p-5) = 2(p-6)$

6. $12(b-3) = -(6b+12)$

Solving Linear Equations
SLOT 10

1. $3(x+2)+4=5(x+3)+5$

4. $2(3t-1)-3t-5=5(t+1)+6$

2. $-3(2n-3)+3=-6(n-1)-2-n$

5. $2(6+4k)+1=6(k-3)-6k-1$

3. $3(p+1)+1=-(-3p+4)-4$

6. $-2(-2b+4)+8-b=5b$

Solving Linear Equations
SLOT 11

1. $(3x - 4) - (4 - x) = 12$

4. $(3t - 4) - (t + 5) = 2t + 8$

2. $-2(3n + 4) - 3(2 - 2n) + (2 + n) = 3$

5. $-2(3k + 1) + (4 - k) = 0$

3. $5 - 3(p - 2) = 11 - 3p$

6. $-(2b + 8) - 3(-2b + 4) = 11$

Solving Linear Equations
SLOT 12

1. $A = bh$ for b

5. $C = \pi d$ for d

2. $A = bh$ for h

6. $P = 4s$ for s

3. $d = rt$ for r

7. $A = lw$ for w

4. $d = rt$ for t

8. $A = lw$ for l

Solving Linear Equations
SLOT 13

1. $P = a + b + c$ for a

5. $P = 2L + 2W$ for W

2. $P = a + b + c$ for c

6. $P = 2L + 2W$ for L

3. $y = mx + b$ for m

7. $Ax + By = C$ for x

4. $y = mx + b$ for x

8. $Ax + By = C$ for y

Name: _____

Mental Math
Multiplication
2-digit by 1-digit - 1

$$\begin{array}{r} 93 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 75 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 46 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 48 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 27 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 21 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 98 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 17 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 28 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 54 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 43 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 15 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 19 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 65 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 44 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 50 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 68 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 27 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 75 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 72 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 71 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 53 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 73 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 65 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 44 \\ \times 9 \\ \hline \end{array}$$

Mental Math
Multiplication
2-digit by 1-digit - 2

$$\begin{array}{r} 20 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 70 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 52 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 56 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 43 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 46 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 53 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 40 \\ \times 7 \\ \hline \end{array}$$

$$\begin{array}{r} 37 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 34 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 49 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 41 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 91 \\ \times 9 \\ \hline \end{array}$$

$$\begin{array}{r} 55 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 56 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 95 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 55 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 43 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 21 \\ \times 3 \\ \hline \end{array}$$

$$\begin{array}{r} 35 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 80 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 25 \\ \times 8 \\ \hline \end{array}$$

$$\begin{array}{r} 97 \\ \times 2 \\ \hline \end{array}$$

$$\begin{array}{r} 37 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 20 \\ \times 7 \\ \hline \end{array}$$

Heading Home

Juanita and Carolyn are both heading home from a trip. Juanita is traveling from Minneapolis, Minnesota to Chicago and is currently 400 miles from home. Carolyn is traveling from St. Louis, Missouri to Chicago and is currently 360 miles from home. Juanita is traveling 50 miles per hour on average and Carolyn is traveling 40 miles per hour on average.

Step 1: Create a table for both Juanita and Carolyn that represents the relationship between time and their distance from home. Begin the table at time 0 hours and continue the table until each of them are home.

CHECKPOINT _____

Step 2: Graph each relationship on a piece of graph paper on the same coordinate axes. Graph the time on the x -axis and the distance on the y -axis.

Step 3: Is the rate of change for both Juanita and Carolyn positive or negative? Explain.

What is the rate of change for Juanita and Carolyn?

Juanita: _____

Carolyn: _____

CHECKPOINT _____

Step 4: Write an equation for each time and distance relationship. Be sure to define your variables.

Juanita: _____

Carolyn: _____

Step 5: **Use your equations** to predict how far each of them will be from home after 4-hours. Show how you used the 4-hours in your equation.

Juanita

Carolyn

CHECKPOINT _____

Step 6: **Use your equations** to predict how long it will take before each of them are 80-miles from home. Show how you used 80-miles in the equation. Round your answer to the nearest tenth.

Juanita

Carolyn

CHECKPOINT _____

Step 7: Juanita is traveling faster than Carolyn based on the story. How can you tell from looking at the graph that Juanita is traveling faster?

Step 8: Mason is traveling home from Nashville, Tennessee to Chicago, Illinois, which is about 480 miles away. Mason is averaging 60 miles per hour.

How would the graph of Mason's time and distance compare to Juanita and Carolyn's?

What is Mason's equation that relates time and distance?

Mason: _____

Graph Mason's equation on the piece of graph paper with Juanita's and Carolyn's.

CHECKPOINT _____

Step 9: **Use your equation** to predict how long it will take Mason to get home.

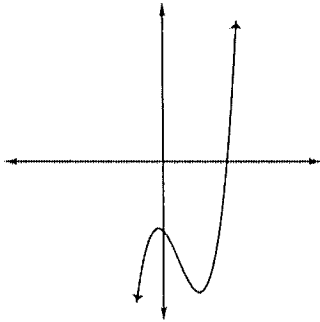
Mind-Map: Functions (FUN 401)

Definition

Function – a relationship where each input has exactly one output

Note: x =input, y =output

Ex: Is the following graph a function?



Functions

Equations

Ex: If $f(x) = -x^2 - 3x + 5$, then $f(-3) = ?$

Ex: If $f(x) = 3x - 1$ and $f(a) = -10$, then what is a ?

Tables

X	Y
0	1
1	2
2	3
3	4
4	5

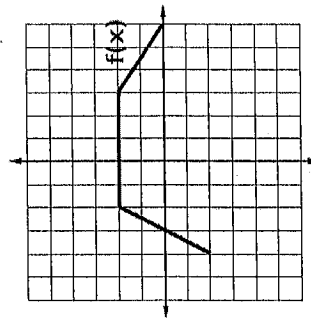
Ex: $f(2)$

Ex: $f(1) + f(3)$

Ex: If $f(a) = 1$, then $a = ?$

Ex: If $f(a) = 3$, then what is $f(2a)$?

Graphs



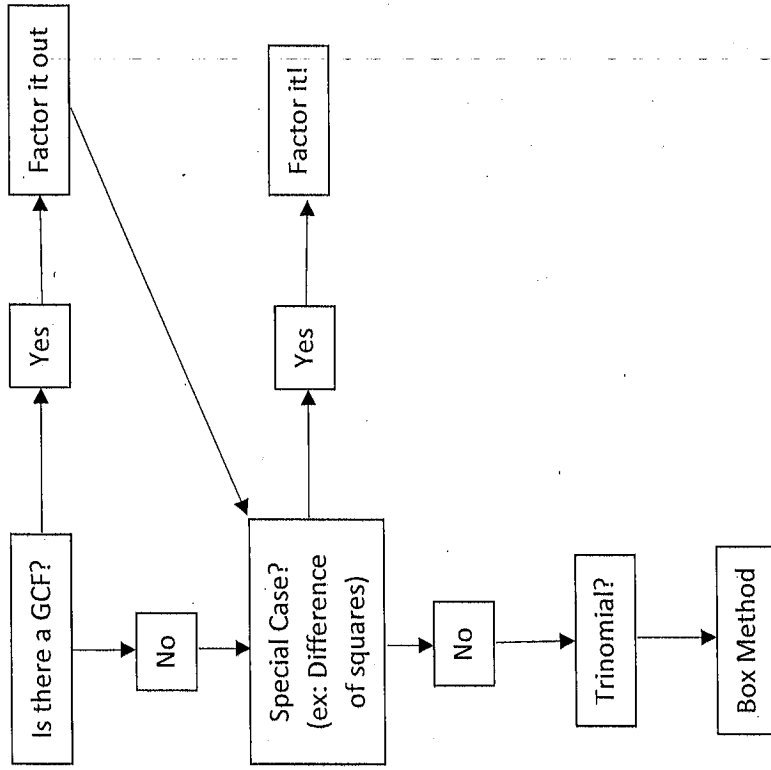
Ex: $f(3)$

Ex: $f(-2) - f(-4)$

Ex: $f(3 - 6)$

Ex: If $f(n) = 0$, then $n = ?$

Mind-Map: Factoring (XEI 505)



Non-Routine

Name: _____

Guess the Number

Find a number that satisfies these conditions: The number has 5 digits. Two of the digits are zeroes. The sum of the digits is 20. The digit in the thousands' place is not zero, and it is three times the digit in the tens' place. What is the number?

Problems courtesy of Ohio Resource Center, Rudd Crawford, and Ohio State University

Non-Routine

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How Does a Mathematician Solve a Difficult Problem?

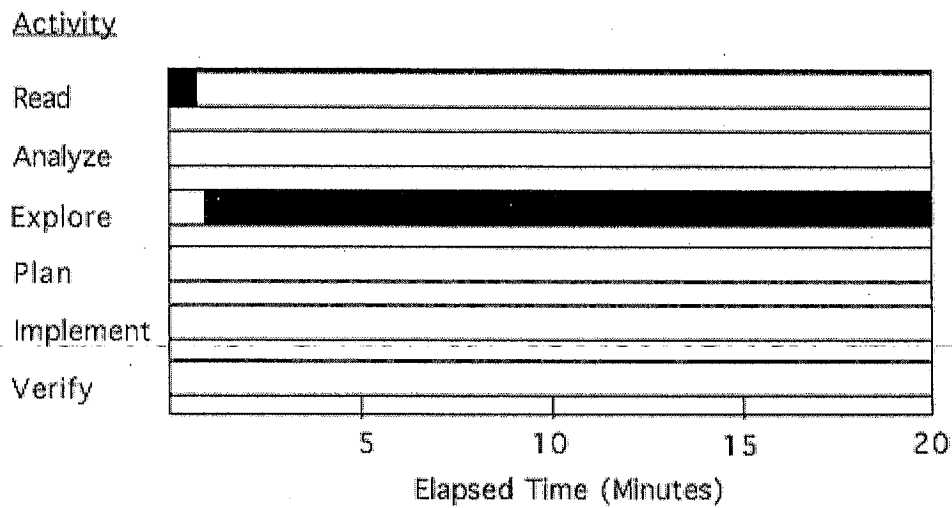


Fig. 3. Time-line graph of a typical student attempt to solve a non-standard problem.

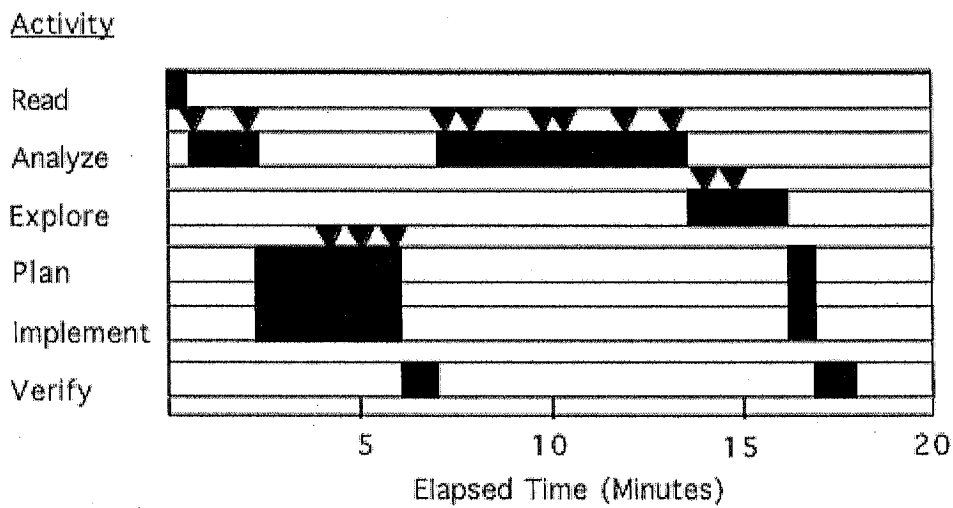


Fig. 4. Time-line graph of a mathematician working a difficult problem

Name: _____

CER – Counterexample – Consecutive Numbers

Consecutive numbers are numbers whole numbers that follow each other in order. For example 3, 4, and 5 are consecutive numbers. Since $3 + 4 + 5 = 12$, the sum of three consecutive numbers is always even. Do you agree with this conjecture?

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Name: _____

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