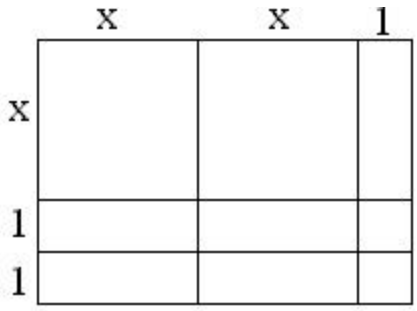
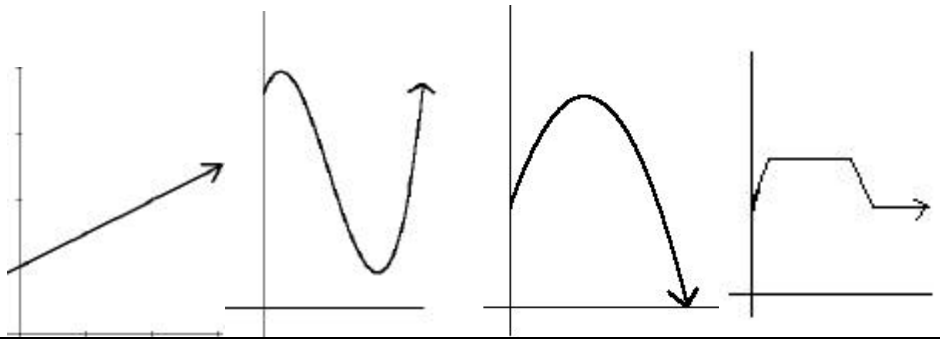
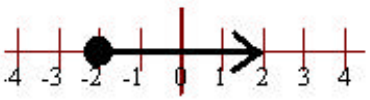
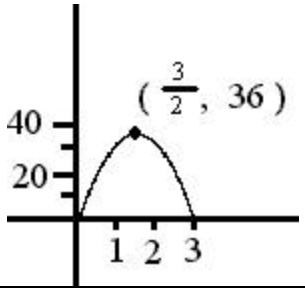
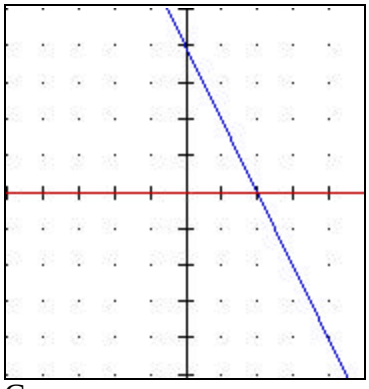
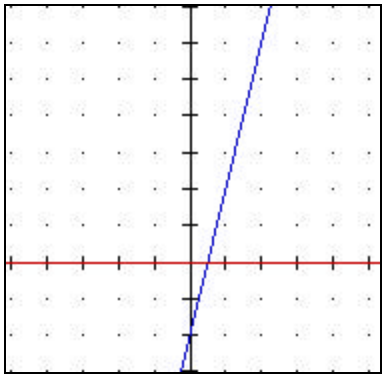
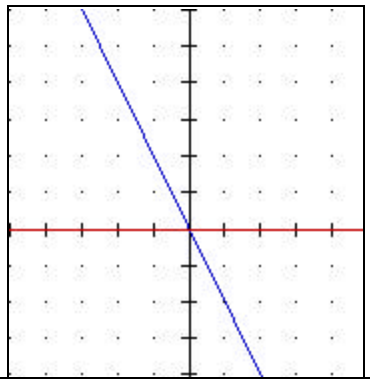
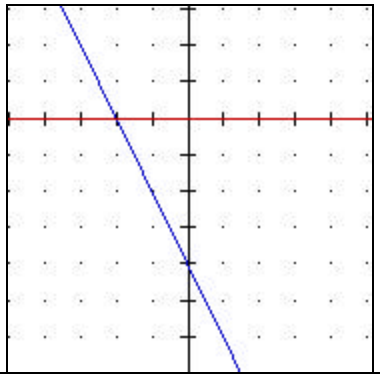
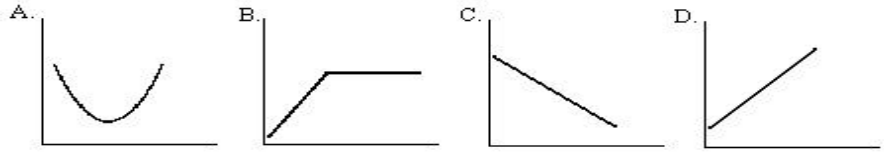
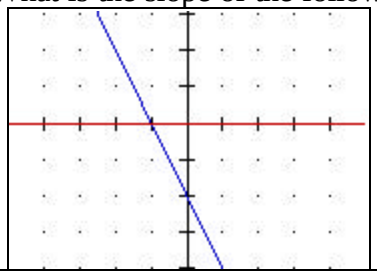
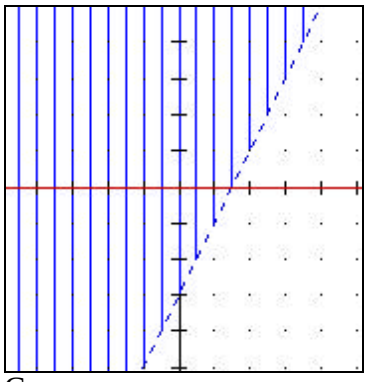
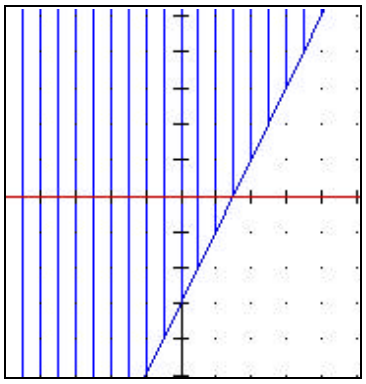
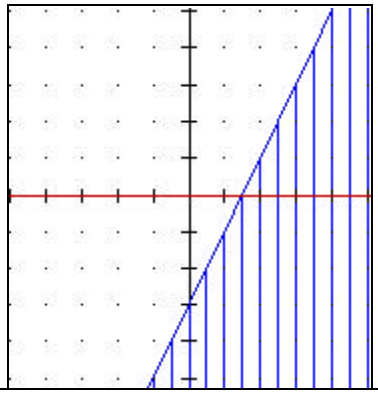
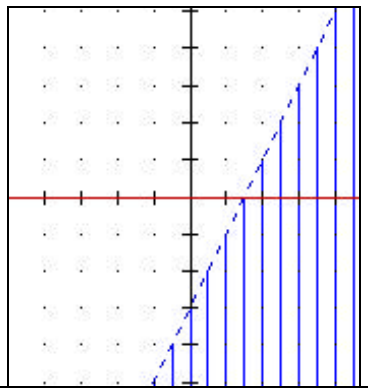
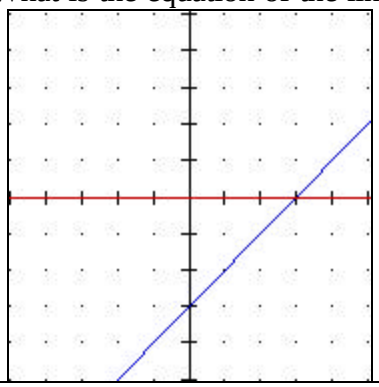
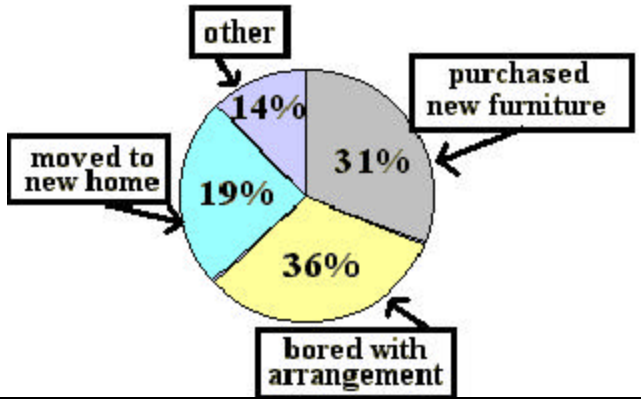
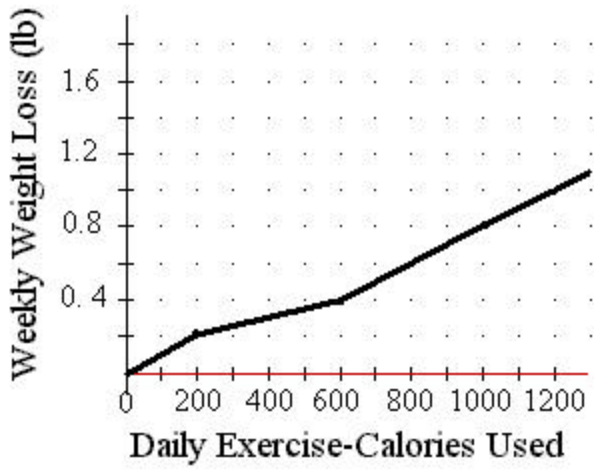
	GATEWAY PRACTICE TEST prepared by Anderson County Teachers based on Gateway Performance Objectives modified by L. Howe, 2005, posted at http://www.howe-two.com	State Performance Objective **HOWE-TWO ACTIVITY** for practice
1.	What is $-\sqrt{121}$? A. −11 B. 11 C. 12 D. −12	I. determine the square root of a perfect square less than 169; RADICALS.
2.	What is the opposite of −5? A. −1/5 B. 5 C. −5 D. 1/5	I. identify the opposite of a rational number; RECIPROCALS & OPPOSITES
3.	What is the coordinate of point B? A. 2 B. ½ C. 3/2 D. 3	III. select the best estimate for the coordinate of a given point on a number line (only rational); NUMBER LINE
4.	Write in exponential form: $2x \cdot 2x \cdot 2x \cdot 2x$ A. $(2x)^4$ B. $(2x)^{-4}$ C. $(2x)^3$ D. $(2x)^{-3}$	I. use exponents to simplify a monomial written in expanded form. (INTRO TO) EXPONENTS
5.	Write in order from least to greatest $\frac{-5}{2}$, 2 , 0 , −2 , 1.2 A. 0, 1.2, 2, -5/2, -2 B. -2,-5/2, 0, 1.2, 2 C. 2, 1.2, 0, -5/2, -2 D. −5/2, -2, 0, 1.2, 2	I. order a given set of rational numbers (both fraction and decimal notations); ORDER
6.	What is the reciprocal of 7? A. −7 B. −1/7 C. 1/7 D. 7/1	identify the reciprocal of a rational number; RECIPROCALS & OPPOSITES
7.	The ratio of the Stone Mountain sculpture to actual size is 20 to 1. The length of a horse's head is 2½ feet. What is the length of a horse's head in the sculpture? A. 15 ft. B. 8 ft. C. 1/8 ft. D. 50 ft.	I. select ratios and proportions to represent real-world problems (e.g. scale drawings, sampling, etc.). EVERYDAY MATH
8.	It is 220 miles from Johnson City to Putnam. The elevation of Johnson City is 3000 Feet. The elevation of Putnam is 3500 feet. What is the average rate of increase in elevation per mile from Johnson City to Putnam? A. .03 B. 29.5 C. 2.3 D. .44	I. apply the concept of slope to represent rate of change in a real-world situation. EVERYDAY MATH
9.	Simplify: $13 + (3 \times 2)^2 - 8$ A. 41 B. 17 C. 353 D. 1016	I. apply order of operations when computing with integers using no more than two sets of grouping symbols and exponents 1 and 2; ORDER OF OPERATIONS
10.	Greg lives in a state where speeders are fined $15 for each mile per hour over the speed limit. Greg was given a ticket for $180 for speeding on a road where the speed limit is 45 miles per hour. How fast was Greg driving? A. 12 mph B. 57 mph C. 54 mph D. 9 mph	II. •apply the concept of slope to represent rate of change in a real-world situation. EVERYDAY MATH ALICE'S DATA

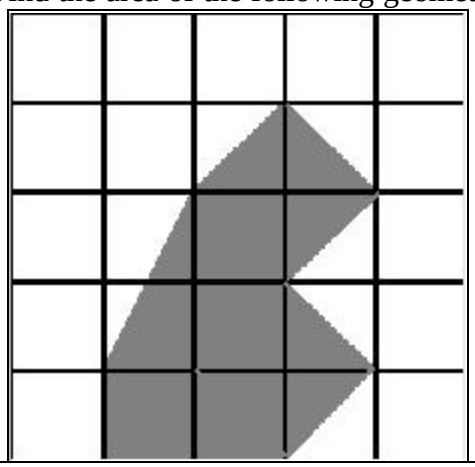
11.	Simplify: $(x^2 + 3x - 5) - (2x^2 + x - 3)$ A. $-x^2 + 4x - 8$ B. $3x^2 + 4x - 8$ C. $-3x^2 + 3x + 2$ D. $-x^2 + 2x - 2$	I. add and subtract algebraic expressions; COMBINE LIKE TERMS
12.	You have 126 feet of 1" by 8" wood. If one birdhouse takes 4½ feet of wood, how many birdhouses can you make. A. 36 B. 28 C. 5 D.	I. use estimation to determine a reasonable solution for a tedious arithmetic computation. EVERYDAY MATH
13.	Multiply and simplify: $(x - 3) (3x + 1)$ A. $9x^2 - 3$ B. $3x^2 - 3$ C. $3x^2 - 8x - 3$ D. $9x^2 + 3$	I. multiply two polynomials with each factor having no more than two terms; MULTIPLY BINOMIALS
14.	Estimate 36.075 – 1.057 A. 35 B. 18 C. 360 D. 24	I. use estimation to determine a reasonable solution for a tedious arithmetic computation. DANCING DECIMALS
15.	Algebra Tiles are arranged as pictured. What product is being modeled?  A. $3x^2 + 3x + 2$ B. $2x^2 + 5x + 2$ C. $2x^2 + 4x + 2$ D. $x^2 + 5x - 2$	I. select the area representation for a given product of two one-variable binomials with positive constants and coefficients. MULTIPLY BINOMIALS
16.	What are the next two numbers in the following pattern? 1, 4, 16, 64, ___ ,___ A. 72, 84 B. 256, 1024 C. 80, 96 D. 16, 64	II. extend a numerical pattern; PATTERNS
17.	What are the next two numbers in the following pattern? 3, 6, –12, 24, ____, _____ A. 48, 96 B. –48, –96 C. –48, 96 D. 48, –96	II. extend a numerical pattern; PATTERNS BORDER PATTERNS PATTERNS IN PASCAL'S Triangle
18.	What are the next two numbers in the following pattern? $\frac{1}{2}, \frac{1}{6}, \frac{1}{18}, \frac{1}{54}$, _____, _____ A. $\frac{1}{162}, \frac{1}{486}$ B. $\frac{1}{8}, \frac{1}{16}$ C. $\frac{1}{120}, \frac{1}{240}$ D. $\frac{1}{90}, \frac{1}{126}$	II. extend a numerical pattern; PATTERNS BORDER PATTERNS PATTERNS IN PASCAL'S Triangle
19.	Evaluate the algebraic expression $R^2 + FW$ if R = –5, F =½ , and W = 4 A. –23 B. 27 C. 33 D. 23	II. evaluate a first degree algebraic expression given values for one or more variables; EVALUATE QUIZ
20.	Evaluate the expression $6Q - (H + P)$ if Q =2, H= –3 and P = 7 A. –27 B. 22 C. 8 D. 16	II. evaluate a first degree algebraic expression given values for one or more variables; EVALUATE QUIZ

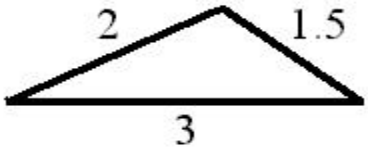
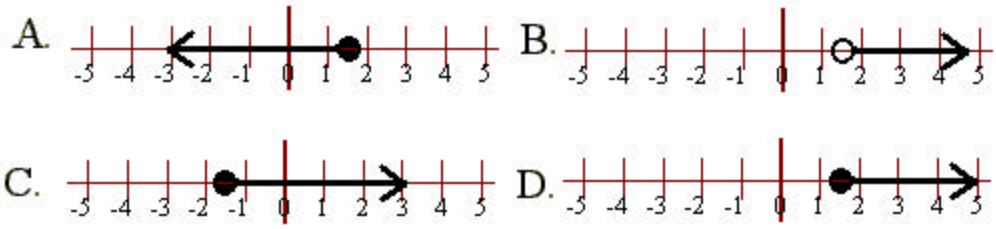
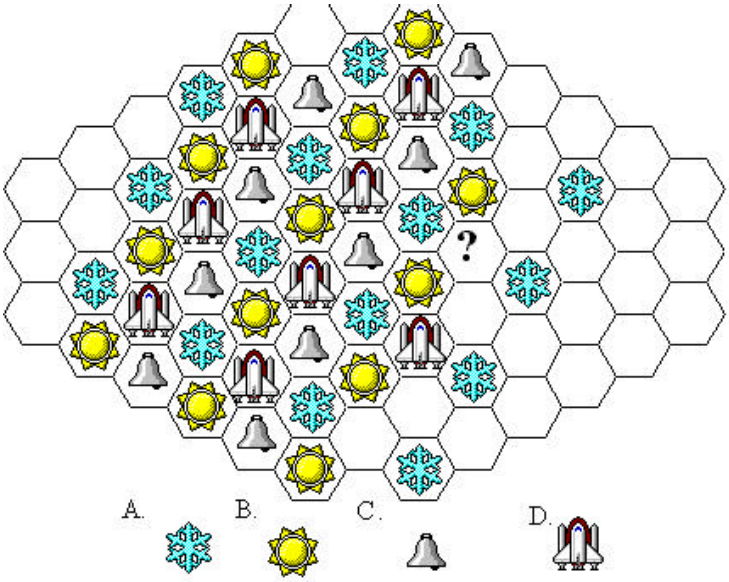
21.	Write the equation of the line represented by the given data: x 1 2 3 4 y 4 8 12 16 A. y = ¼ x B. y = x + 3 C. y = – x –4 D. y = 4 x	II. select the algebraic notation which generalizes the pattern represented by data in a given table; NAME THE RULE ALICE'S DATA
22.	Write the equation of the line represented by the given data: x | y –3 | 5 –2 | 4 –1 | 3 0 | 2 1 | 1 A. y = –x +2 B. y = x –2 C. y =2x –1 D. y = ½ x – 2	II. select the algebraic notation which generalizes the pattern represented by data in a given table; NAME THE RULE ALICE'S DATA
23.	Translate the following into an equation: " The Product of nine and a number is three." A. 9/x = 3 B. 9x = 3 C. 3x = 9 D. x + 9 =3	III. translate a verbal sentence into an algebraic equation; TRANSLATE
24.	Translate the following into an equation: "Sixty-seven less than a number is negative twelve. A. n – 67 = –12 B. 67 – n = –12 C. 67 n = –12 D. n/67 = –12	II. translate a verbal sentence into an algebraic equation; TRANSLATE
25.	Solve: .3 –2.5 n = 7.8 A. n = 1/3 B. n = 3 C. n = –3 D. 3.24	II. solve multi-step linear equations (more than two steps, variables on only one side of the equation); LEARN TO SOLVE
26.	Solve: 5 x – 3 = –2 (4 – 3x) A. x =5 B. x = 1 C. x = –5 D. x = –1	II. solve multi-step linear equations (more than two steps, with one set of parentheses on each side of the equation); LINEAR MATHO, MATHO II
27.	An airplane flies 1000 miles due east in two hours and 1000 miles due south in 3 hours. What is the average speed of the plane? A. 282.8 mph B. 1000 mph C. 400 mph D. 316. 2 mph	II. apply the concept of rate of change to solve real-world problems; EVERYDAY MATH
28.	Which of the following graphs best represents the path of a ball thrown into the air? A. B. C. D. 	II. select the non-linear graph that models the given real-world situation or vice versa; FAMILY OF FUNCTIONS

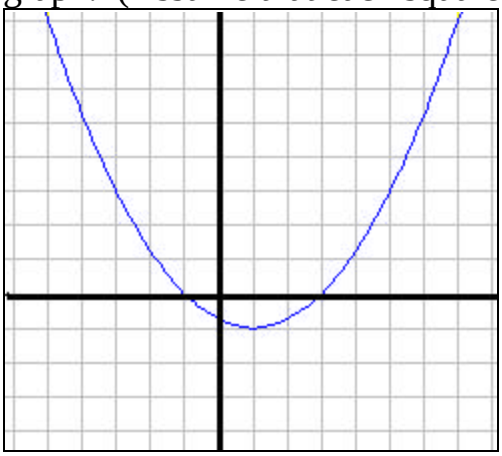
29.	Identify the correct graph for x > –2. A. B. C. D. 	II. identify the graphical representation of the solution to a one variable inequality on a number line. INEQUALITIES
30.	What is the domain of this graph?  A. All real numbers. B. $0 \le x \le 36$ C. $0 \le x \le 3$ D. x = 1.5	II. determine the domain and/or range of a function represented by the graph of real-world situations. DOMAIN.EXE
31.	What is the range of the graph in the last problem? A. All real numbers. B. $0 \le x \le 36$ C. $0 \le x \le 3$ D. x = 36	II. determine the domain and/or range of a function represented by the graph of real-world situations. DOMAIN.EXE
32.	Which of the following is the graph of y = – 2x + 4 ? A.  B.  C.  D. 	II. select the graph that represents a given linear function expressed in slope-intercept form; TWO POINTS GUESS-A-GRAPH TWO WAYS OF GRAPHING
33.	Which of the following graphs best represents the statement: "The population of frogs decreased as the pond became more polluted."? 	II. select the non-linear graph that models the given real-world situation or vice versa;

34.	What is the slope of the following graph?  A. ½ B. 2 C. –½ D. –2	II. determine the slope from the graph of a linear equation (no labeled points) POINT & SLOPE TWO POINTS
35.	Which of the following graphs represents the inequality $y > 2x - 3$ A.  B.  C.  D. 	II. select the appropriate graphical representation of a given linear inequality; GRAPH 2-D
36.	What is the equation of the line in the graph below:  A. $y = -x + 3$ B. $y = x - 3$ C. $y = 3x + 1$ D. $y = -3x + 1$	II. select the graph that represents a given linear function expressed in slope-intercept form; TWO POINTS GUESS-A-GRAPH TWO WAYS OF GRAPHING
37.	Solve: $\frac{x}{3} + 11 = -29$ A. 6 B. –120 C. $13\frac{1}{3}$ D. 54	II• solve multi-step linear equations (more than two steps, variables on only one side of the equation); LINEAR MATHO,MATHO II
38.	Owen's scores on the first three out of four total tests in his math class were 89, 92, 82. What score must he receive to have an average of 90 in the class? A. 97 B. 92 C. 90 D. 100	V. determine the mean (average) of a given set of real-world data (no more than five two-digit numbers); MASTERINGMATHEMATICS INTRO TO DATA

39.	You rode your bike to and from school each day for one week. Your daily riding times are given below. What was your average riding **time per day**? **Monday Tuesday Wednesday Thursday Friday** to school 12 min 15 min 15 min 13 min 13 min from school 14 min 14 min 14 min 14 min 14 min A. 18 min B. 14 min C. 27.6 min D. 20 min	V. determine the mean (average) of a given set of real-world data (no more than five two -digit numbers); MASTERING MATHEMATICS INTRO TO DATA
40.	Find the median of the following numbers: 4, 6, 6, 8, 1, 1, 3, 4, 6, 7 A. 6 B. 5 C. 4.6 D. 7	V. determine the median for a given set of real-world data (even number of data). MASTERING MATHEMATICS INTRO TO DATA
41.	If 5 people can sit at the head table for a banquet and there are 10 people to choose from, how many different seating arrangements can be made? A. 55 B. 900 C. 16,025 D. 30,240	V. • apply counting principles of permutations or combinations in real-world situations. COUNTING
42.	Using the graph below, determine how many people rearrange their furniture due to being bored with the arrangement if 10,000 people were surveyed.  A. 360,000 B. 2,780 C. 3,600 D. 278	V. • interpret circle graphs (pie charts) representing real-world data;. CIRCLE & BAR GRAPHS
43.	Using the graph below, determine the approximate weight a person will lose each week if his/her exercise uses 150 calories per day.  A. 0 .7 pounds B. 0.4 pounds C. 0.8 pounds D. 0.2 pounds	V. • make a prediction from the graph of a real-world linear data set; ALICE'S DATA

44.	Find the area of the following geometric figure:  A. 7.5 square units B. 7 square units C. 12.8 square units D. 8.5 square units	IV. • estimate the area of irregular geometric figures on a grid; ESTIMATE AREA
45.	Find the area of a rectangle with a length of 26 centimeters and a width of 17 centimeters. A. 442 cm^2 B. 86 cm^2 C. 43 cm^2 D. 221 cm^2	IV. apply the given formula to determine the area or perimeter of a rectangle. VOLUME & AREA
46.	Find the perimeter of a rectangle with a length of 38 ft and a width of 23 ft. A. 61 ft B. 874 ft^2 C. 122 ft^2 D. 122 ft	IV. apply the given formula to determine the area or perimeter of a rectangle. VOLUME & AREA
47.	Find the distance between the two points (2, 5) and (8, 1) given the Pythagorean Theorem $c^2 = a^2 + b^2$ where c is the hypotenuse of the right triangle and a and b are the legs. A. 10 B. 5 C. 7.2 D. 52	III. calculate the distance between two points given the Pythagorean Theorem and the distance formula. PYTHAGOREAN DISTANCE & MIDPOINT
48.	Find the distance between the two points (3,–1) and (0, 3) using the distance formula: $D = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$ A. 4 B. 5 C. 7.2 D. 52	III. calculate the distance between two points given the Pythagorean Theorem and the distance formula. PYTHAGOREAN DISTANCE & MIDPOINT
49.	Find the area of a circle with a diameter of 14 inches. ($A=\pi r^2$) A. 153.86 in^2 B. 615.44 in^2 C. 43.96 in^2 D. 21.98 in^2	IV. apply the given formula to find the area of a circle, the circumference of a circle, or the volume of a rectangular solid; VOLUME
50.	Find the circumference of a circle if the diameter is 5.5 meters. A. 8.64 m B. 17.27 m C. 94.99 m D. 17.27 m^2	IV. apply the given formula to find the area of a circle, the circumference of a circle, or the volume of a rectangular solid; VOLUME
51.	Find the volume of sand in a sandbox that measures 6 feet long, 4 feet wide, and 2 feet high if the box is completely full. A. 48 ft^3 B. 88 ft^3 C. 2304 ft^3 D. 96 ft^3	IV. apply the given formula to find the area of a circle, the circumference of a circle, or the volume of a rectangular solid; VOLUME
52.	Sam is building a workshop that is 16 feet long and 12 feet wide. He wants to use the fact that the diagonals of a rectangle are equal to insure that the corners of his workshop are right angles. What should the diagonals measure? A. 14 ft B. 28 ft C. 192 ft D. 20 ft	III . illustrate the Pythagorean Theorem by measuring the length, width, and diagonals of rectangular objects apply the given Pythagorean Theorem to a real life problem illustrated by a diagram (no radicals in answer); PYTHAGOREAN

53.	You are designing a flower garden that is in the shape of a triangle. You have drawn a blueprint that looks like the diagram below. If the ratio of the blueprint to the actual flower garden is 1:10, what is the length of the longest side of the actual flower garden? A. 20 feet B. 15 feet C. 65 feet D. 30 feet 	III. apply proportion and the concepts of similar triangles to find the length of a missing side of a triangle. EVERYDAY MATH
54.	Evaluate the algebraic expression x + y - z if x=16, y =2.6 and z = –5. A. 23.6 B. 13.6 C. 18.4 D. 29	II. • evaluate a first degree algebraic expression given values for one or more variables; QUIZ EVALUATE
55.	Solve the following equation: 5 x – 3 = –2(4 – 3x) A. –5 B. 11 C. 5 D. –11	II. solve multi-step linear equations (more than two steps, with one set of parentheses on each side of the equation); LINEAR MATHO, MATHO
56.	Jesse is driving an average speed of 55 mph. How far will he travel in 4½ hours? A. 12.2 miles B. 247.5 miles C. 220 miles D. 1000 miles	II. apply the concept of rate of change to solve real-world problems; EVERYDAY MATH
57.	Identify the correct graph for $x \geq 1.5$ 	II. select the appropriate graphical representation of a given linear inequality; INEQUALITIES
58.	The icons are being arranged in a pattern. If the pattern is continued which icon should be placed in the hexagon marked with a question mark? 	II. Extend a geometric pattern. PATTERNS IN PASCAL'S TRIANGLE TRANSFORMATIONAL GEOMETRY

59.	Gary has a collection of dimes and quarters. There are twenty coins in all. The collection is worth $2.60. Select equations that could be used to find the number of each type. A. $x + y = 20$ $x + y = 2.60$ B. $x + y = 20$ $10x + 25y = 260$ C. $x + y = 20$ $10x + 25y = 2.60$ D. $10x + 25y = 20$ $x + y = 2.60$	II. Select the system of equations that could be used to solve a given real world situation. WORD PROBLEMS
60.	Solve the equation $x^2 + 5X - 6 = 0$ A. –6, 1 B. – 3, –2 C. 6, –1 C. 3, 2	II. Find the solution to a quadratic equation given in standard form (integral solutions and a leading coefficient of one) QUADRATIC MATHO
61.	What is the solution of the quadratic equation represented by this graph. (Assume that each square represents one unit.)  A. –1, 3, -3/4 B. – 3, 1 C. -1/2 , –1 C. 3, -1	II. select the solution to a quadratic equation given solutions represented in graphical form (integral solutions.) ZEROS FROM GRAPH
62.	Which of the following is a factor of this quadratic equation? $x^2 + 5X - 6 = 0$ A. (x + 6) B. (x – 6) C. (x – 3) C. (x + 1)	II. Select one of the factors of a quadratic equation. FACTOR TRINOMIALS
63.	What is the discriminant of this quadratic equation. $x^2 + 4X - 12 = 0$ A. 6 B. 2 C. 64 C. –8	Select the discriminant of a quadratic equation (integral solutions) QUADRATIC FORMULA

ANSWERS

1.	A		
2.	B	34.	D
3.	C	35.	A
4.	A	36.	B
5.	D	37.	B
6.	C	38.	A
7.	D	39.	C
8.	C	40.	B
9.	A	41.	D
10.	B	42.	C
11.	D	43.	C
12.	B	44.	A
13.	C	45.	A
14.	A	46.	D
15.	B	47.	C
16.	B	48.	B
17.	D	49.	A
18.	A	50.	B
19.	B	51.	A
20.	C	52.	D
21.	D	53.	D
22.	A	54.	A
23.	B	55.	C
24.	A	56.	B
25.	C	57.	D
26.	A	58.	D
27.	C	59.	B
28.	C	60.	A.
29.	B	. 61.	C
30.	C	. 62.	A
31.	B	. 63.	C
32.	A		
33.	C		