The GED Math test is 50% pre-algebra, 30% algebra, and 20% geometry. 56 multiple choice problems to be completed in 90 minutes.

The GED Mathematics Review

$3.00
Proceeds go to THE MATH LAB

Math Reference Guide *Everything you need to know at your fingertips!*

Defendit Numerus: There *is* safety in numbers!

E-Mail address

Designed by G. Andrew Page, Math Teacher, Adult & Continuing Education Center, THE MATH LAB, 1810 Bull St. Savannah, GA 31401 (912) 651-7321 or E-Mail: mathlab@juno.com COMMENTS / ORDERS Welcome!

Problem Solving Steps

The General Education Diploma Mathematics test is designed to measure your ability to solve "real life" problems. This educational manipulative is designed for the adult learner who needs only a quick and concise "refresher" of the concepts to make an "adequate score on the GED Math exam. This reference handout is also for the learner who is discoveng these concepts for the first time.This exam is NOT about tedious computation. It is about problem solving. In order to organize your thoughts about these word problems it is helpful to follow A STRATEGY based on these simple steps: (1) Read and reread problem; (2) Find action verbs; (3)Decide which operation; (4) Carefully do computation; and (5) Check to make sure your answer is reasonable and that it answers the question in a sensible way. Reread the problem a piece at a time. TIP: Draw a sketch to get a better mental picture of what is being asked. TIP: Remember some problems contain more information than you need while other word problems on the GED have "Not enough information is given" which is a valid answer. TIP: There is *no* one "right" way to do a math problem, use different strategies to arrive at your answer.

ADDITION KEY WORDS: Sum, total, combine, plus, whole, together (You can add more words to this list...)
SUBTRACTION KEY WORDS: Minus, difference, before and after, change, less,
MULTIPLICATION KEY WORDS: Times, going from one to many, double, triple, percent of, interest of $, distance (when you know rate and time),
DIVISION KEY WORDS: Split, cut, average, from many to one, separate, quotient,

BASIC ARITHMETIC SHORTCUTS: *ESTIMATION/ROUNDING* is an extremely important skill to use because it will allow you to approximate the actual answer. For example, Joe went to the grocery store and bought half a dozen apples for .99 and a jar of peanut butter for $2.49. What was his total bill excluding tax? (1) Round off .99 to $1.00 (2) Round off $2.49 to $2.50 (3) Add the two totals tofether to get approximately $3.50. If you put yourself "in the situation" of any word problem it will help you understand the problem better!

MULTIPLYING: *Generally, when multiplying to get your answer you can* ***ESTIMATE*** *too. For example: If Jane needs 25 chairs on each row, and there are 100 rows, how many chairs will she need to fill the auditorium? Anytime you multiply in the base 10 number system just add the number of zeros to the original number. i.e. 100 has two zeros, so add the two zeros to 25 to get the answer of 2500 chairs. If there were 10,000 you would add 4 zeros.* ***The DISTRIBUTIVE PROPERTY states that A(b+c) = Ab + Ac. Ex. 4 (5+2) = 4(5) + 4(2) = 20 + 8 = 28*** ***REMEMBER: If a number is outside the parenthesis or any grouping symbols {[ ]} you multiply.***

MEASUREMENT: *A CONCISE METHOD OF SUCCESS:* Be familiar with the following measurements. While there are many more, these are the most frequently used. You will be asked to convert, but not from English to metric. These are ENGLISH Measurements: 1 foot = 12 inches; 1 yard = 36 inches; 3 feet = 1 yard; 1 mile = 5,280 feet; 1 mile = 1,760 yards; 1 gallon = 4 quarts; 2 pints = 1 quart; 52 weeks in a year; 12 months in a year; 16 ounces = 1 pint and 1 pound.
METRIC: Meter=length, Gram= solid weight,Liter=liquid quantity, the following are the most common (not all) prefixes: Kilo=1000; Deci = 1 / 10; Centi = 1/100; milli = 1/1000 (Compare with scientific notation) Therefore, if John has a board that is 2.5 meters long it is equal to 250 centimeters because 2.5 x 100 = 250 cm. To better illustrate, a centimeter is about as wide as your smallest fingernail, a decimeter is about as wide as you hand, a millimeter about the width of a dime, a meter is a little longer than a yard, and liter is similar to a quart.

FRACTIONS: Types of fractions: Proper: The top number or numerator is smaller than the bottom number or denominator. ex. 3/4, 4/7 15/32 Improper: The top number is equal to or greater than the denominator. ex. 13/3, 5/5, 17/6 Mixed Number: A whole number and a proper fraction. ex. 3 4/5 19 7/8, 54 3/16 Note: Any proper fraction should always be reduced to lowest terms or simplified. Ex. 50/100 = 1/2, 100 / 120 = 5 / 6 Knowing the different combinations or factors of large numbers will assist you in factoring. It takes practice at first. Here are some *ALGORITHMS:* An ALGORITHM is a term for a computational procedure. Know these algorithms to help with fractions and factoring. A number is evenly divisible by "2" when it's an even number. A number is divisible by "3" if the sum of the digits it divisible by 3. Ex. 237 is 2+3+7=12; 12 is divisible by 3 so 237 is divisible by 3. A number is divisible by "4" when the given number is divisible by 2 and the result is even. Ex. 492 when divided by 2 is 246; 246 is even and divisible by 4. 230 is divisible by 2 but 115 is not an even number and therefore 230 is not divisible by 4. A number is divisible by "5" if the number ends in "5" or "0". A number is divisible by "6" if the number is even and divisible by 3. Ex. 186 is even and 1+8+6 = 15 which is divisible by "3" making 186 divisible by "6". A PRIME number is a number which only has 1 and that number as a factor. Ex. "7" is prime because the only factors are 1 X 7 whereas the opposite of prime is *COMPOSITE*. A Composite number can be evenly divided into factors. Ex. "24" = 2 X 12, 4 X 6, 8 X3, and 24 X 1. Therefore, anytime you reach a prime number in the numerator and denominator you CANNOT reduce further. Ex. *17/41, 7/11, and 19/23* are all in lowest terms. *ADDING/SUBTRACTING FRACTIONS:* When denominators are the same simply add/subtract the top numbers. Ex. 2/5 + 1/5 = 3/5. 14/15 - 3/15 = 11/15. When denominators are different you must find a least common denominator (LCD)Ex. 2/6 + 1/4 The LCD is 12 because the denominators 6 and 4 both go evenly into 12. 2/6 = 4/12, 1/4 = 3/12 and 4/12 + 3/12 = 7/12. The same is true for subtraction. Ex. 6 4/5 - 3 2/3 = 6 12/15 - 3 10/15 because "15" is the LCD. Subtract the whole numbers 6-3 = 3 then the fraction to get 2/15. Answer: 3 2/15 To change an Improper fraction like 47/15 always divide. The remainder is the numerator. When subtracting 4 1/4 - 2 6/7 you get the LCD of 28 and then change the fractions to improper. i.e. 4 1/4 = 4 7/28 = 119/28 - 80/28 = 39/28 = 1 11/28. MULTIPLYING FRACTIONS: No need to find a common denominator in multiplication or division of fractions. If you have a mixed number like 5 ¼ change it to two numbers or an improper fraction = 21/4. Remember: Any number times its reciprocal is "1". TIP: To determine if one fraction is larger or smaller than the other, multiply the cross products and choose the larger number. Ex. 4/5 < 7/8 because 4 x 8 = 32 and 5 x 7 = 35. Simplify if possible by cross-cancelling. i.e. 6/8 x 4/12 6 goes into 12 and 4 goes into 8 thereby reducing the answer to 1/4. TIP: Anytime you want to "of" something you multiply. Ex. What is ¾ of a dozen? ¾ x 1 2/1 = 9. *DIVIDING:* Always divide the whole amount by the part. ex. Bill want to make shelves that are 2 1/2 feet each. How many shelves can he cut out of 45 feet of lumber? 45/1 ÷ 5/2 = 45/1 x 2/5, 5 goes into "45" 9 times. 9 x 2 = 18 shelves. Always "flip" or invert the second number after the division symbol (divisor). *DECIMALS:* Decimals are a way of writing fractions without a denominator. They can represent the same quantity. Ex. ¾ = .75 (Think about money) Every number has a decimal point. If it's not written it is AFTER the number. 4 = 4.000 KNOW the place value of a number .1 = one tenth .01 = one hundredth .001 = 1 thousandth .0001 = one ten thousandth .00001 = one hundred thousandth. It is important to put the "th" at the end.

ADDING/SUBTRACTING If given the numbers horizontally align them vertically with the decimal points on top of each other. Add zeros if necessary. Ex. 9.002 + .0003 + 7 =

```
  9.0020   <—When adding/subtracting
  0.0003         When multiplying, –> —>  8.75  (2 places)
 +7.0000                                  x.006 (3 places)
 16.0023 <— 16 and 23 ten thousandths     .05250
```

In both problems the zeros are necessary.

When multiplying by 10, 100, 1000 etc. move the decimal point to the right by the same number of zeros. Ex. 4.234 X 100 = 423.4 .24 x 10 = 2.4 Some COMMON fractions and the % and decimal equivalents which you should MEMORIZE to save time.

1/4 = .25 = 25%	1/8 = .125 = 12.5% or 12½%
1/5 = .20 = 20%	7/8= .875=87.5% or 87 ½%
1/6 = .166 = 16.6% or 16 2/3%	3/4 = .75 = 75%
5/6 = .833 = 83.3% or 83 1/3%	2/3 = .666 = 66.6% or 66 2/3%
1/3 = .333 = 33 .3% or 33 1/3%	5/8 = .625 = 62.5% or 62½ %

PERCENTAGE: % Means a part of 100. 6% sales tax means .06 as a decimal and 6/100 as a fraction. To change a % o a decimal move the decimal TWO places LEFT. Ex. 12.5% = .125 = 125 / 1000 = 1 / 8 in final reduced form. To change a decimal (.625) to a % move the decimal TWO places to the RIGHT. **FINDING THE WHOLE: These type of % word problems are identified when you know the answer is larger than the other two numbers. Ex. Bob paid $14.70 tax on a new camera.** The sales tax was 6%. What is the cost of the camera & final cost. 14.70/.06 = $245 camera + add the $14.70 tax = to get $259.70 **FINDING*THE PERCENT:*** part/whole=% Ex. In a GED class their are 10 men and 20 women. Women make up what % of the class? 20/30 =2/3 = .666 or 66 2/3% REMEMBER:(Strategy)You can change a fraction into a % by multiplying by 100.

STATISTICS: The *MEAN* is also the average. Add the numbers and then divide by the total amount of numbers. The mean of 100, 90, and 80 is equal to 270/3 = 90. The *MEDIAN* is the middle number in a ordered group. Ex. 1,2,3,4,5 The median is 3. If there is an even amount of numbers, add the two middle numbers and divide by 2. Ex. 50, 60, 70, 80 Add 60 +70 = 130/2 =65. The *MODE* is the most frequently occuring number in a series. Ex. 3,4,5,2,2,3,6,3,7,3, The Mode is 3 because it occurs 4 times. 2 modes = bimodal. The *RANGE* is the difference between the high and low numbers. Always subtract to find the range. The RANGE of 30, 27, 40, and 50 is 23 Because 50(high) - 27 (low) = 23 . ☺

Scientific Notation: **A shorthand method of writing large and small quantities in an abbreviated form. First, you must know the Base 10 number system. (Like the Metric System)**
$10^0 = 1$ $10^1 = 10$ Each time the result is 10 times larger.
$10^2 = 100 = 10 \times 10 = 100$
$10^3 = 1000$ or $10 \times 10 \times 10$
$10^4 = 10{,}000$; (4th power)
$10^5 = 100{,}000$; (5th)
10^6 Power = 1,000,000
$10^7 = 10{,}000{,}000$
$10^8 = 100{,}000{,}000$

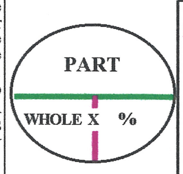
Order of Operations: The steps to a multi-step problem: Parenthesis, inner before outer, Powers, Mult/Division, ADD/ SUB. in the order they appear from left to right. REMEMBER: P. P. M. D. A. S.

Small Numbers are always noted by a negative (-) power or exponent. 10^{-1} = 1/10 or .1, 10^{-2} = 1/100 or .01, 10^{-3} = 1/1000 or .001.(Metric) Ex. Hair grows at 10^{-8} (to the negative eighth power) in miles per hour. What is the decimal equivalent? .00000001 or 1/100,000,000 mph. TIP: The exponent or power is also the number of zeros in the decimal or whole number equivalent Ex. 10(8th power) = 100,000,000. RULE: Any number to the zero power is 1. Rule: Any number to the 1st power is that number. Ex. $9^1 = 9$ whereas $9^0 = 1$. Also, $4^{-2} = 1/16$, $6^{-2} = 1/36$, $2^{-3} = 1/8$, RULE: A negative exponent always has a 1 as the numerator.

Distance= Rate x Time
300 miles = 60mph x 5 hours; How Far? **D=RT; How long?T=D /R; How fast?R=D / T;**

Interest = Principal ($) x Rate x Time

Percentage Device: Use this device to determine whether to multiply or divide in a % problem. i.e. To find the PART, cover up the word part, leaving Whole x %. The WHOLE is equal to the part divided by the %. The % is equal to the part divided by the whole.



Number Series: What is the next number in this series? ½, ¾, 1, 1¼, ___. The answer is 1½. You add ¼ each time.

% *FINDING THE PART:* Mult. the whole x %. Ex. How much tax will be paid on a $56 sweater when the sales tax is 6%? Mult. 56 x .06 = $3.36 If you want to find the total bill add 3.36 to 56 = $59.36. *% OF INCREASE/DECREASE:* Find the difference between the quantities and then divide. Ex. In a class of 20 students, 4 more were added. What is the % increase in students? Divide the difference 4 ÷ 20 to get 1/5 = 20 = 20% increase. Ex. If the price of a stereo was reduced from $600 to $400, this represents what % of a decrease? Divide the difference or $200 by the original value $600 to get 1/3 or 333 = 33 1/3% decrease. SUCCESSIVE %: Do not always add two percents together! Ex. If a used car selling for $5000 was reduced by 5% one week and then by 5% of that already reduced price the next week, what is the new sell price? Mult. 5000 x .05 = $250 then subtract 250 from 5000 = 4750. Mult 4750 x.05 = 237. 50 and subtract this from 4750 which = $4512. 50. Contrast this answer with 10% of $5000 = $500.00 $5000 -500 = 4500. There is a $12.50 difference between the two computations!

RATIO: A way of decribing a relationship between two or more numbers. Ex. 2:1 =2 to 1, 4 to 5 = 4:5 or 4 / 5, 30:25 = 6:5 or 6 / 5 (NOT 1 1/5! or 1 1/5 because you *never* change to a mixed number). *PROPORTION:* Two equal ratios. Ex.If 4:5 dentists prefers toothpaste A and a total of 100 were surveyed, this means that 80 prefer toothpaste A. Ex.

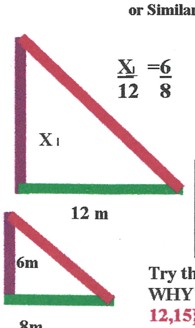
$$\frac{9}{7} = \frac{x}{56}$$

Multiply diagonally 9 X 56 = 504 and then divide by 7 = 72 Notice the 2nd group is 8 times larger than the 1st. TIP: It is very helpful to line up the labels like the example below to maintain correct order. Bill can buy 60 nails for $3.60, how much would 100 nails cost?

$$\frac{60 \text{ nails}}{\$3.60} = \frac{100 \text{ nails}}{\$\,?} \qquad 3.6 \times 100 = 36 \div 6 = 6$$

Answer: $6.00
Another strategy is to find the unit price of 1 nail(3.60/60) which is .06 per nail then MULTIPLY by 100 = $6.00

Proportion Application: Congruency or Similarity



$$\frac{X_1}{12} = \frac{6}{8} \quad \rightarrow\rightarrow\rightarrow$$

x = 9

Pythagorean Theorem

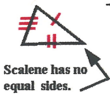
$C^2 = A^2 + B^2$

In the right triangle at the left or the circle above, the vertical purple line combines with the green (horizontal) to form a 90 °degree angle. The red lines are the "C" side or hypotenuse. To find the length of the hypotenuse (C) multiply 6 x 6 and ADD to 8 x 8. Take the square root of √100, (what number times itself equals 100) = 10.

Try this using a ruler and A = 3, B = 4, C = 5. In the larger triangle C = 15. WHY? Memorize these "triplets" of numbers! {3,4,5} {6,8,10} {5,12,13} {(9, 12,15} {15, 20, 25} or any multiples of these numbers are proof of the Pythagorean Theorem! This theorem has been considered the most important theorem in ALL of the mathematics subiect areas!! ☺

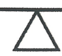
A Concise Method of Success Geometry, Algebra, Charts & Graphs

LINEAR FORMULAS = 1 dimension = Perimeter & Circumference(distance around a circle) AREA formulas always have square units Ex. meters². VOLUME formulas have cubic units. Ex. feet³ or CUBIC FEET.



Equilateral triangles have three ↓ equal sides.

Scalene has no equal sides.



LENGTH=L

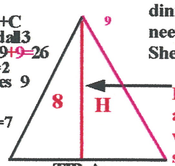
Ex. Jim is putting fencing around his backyard. He needs to know the distance around. If the length is 25 ft. and the width 40 ft. How many feet of fencing will he need? P= 2(25+40) = P=2(65) =130 feet What is the Area of the backyard? A= LW A= 40 x25 A= 1000 square feet To find the number of square yards divide by nine. Answer:

AREA= region inside = LW

Perimeter= 2(L) + 2(W)

AREA: Ex. Paula is putting down carpet in her new home. The dining room is 15´ x 10´. How many square yards of carpet does she need? A=15x10 = 150 sq.ft. (divide by 9 to get sq.yds) = 16 2/3 yds². She needs to buy 17 yards and will have 1/3 square yards left over.

P=A+B+C {Just add all 3 sides} 7+9+9=26 Isosceles=2 equal sides 9



BASE =7 AREA = 28 sq. units.

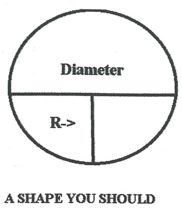
$A = \frac{BH}{2}$

TIP: Any triangle has 180° as the sum of the 3 angles.

Height is always the vertical straight-line distance in a triangle. How do you measure your height?

Circumference = π (d) or 3.15(d) or C=2(pi)r

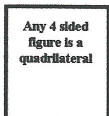
Radius =½ Diameter



THE AREA OF A CIRCLE IS FOUND BY MULT. Π * R * R. (A= ΠR²) Ex. IF R = 7 MULT. 3.14(49) = 153.86 SQ. UNITS. IF THE PROBLEM GIVES THE DIAMETER DIVIDE BY 2, THEN SQUARE THE NUMBER AND MULT. BY 3.14 OR 22/7.

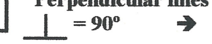
TIP: WHEN WORKING A WORD PROBLEM THAT INVOLVES A SHAPE YOU SHOULD TRY TO DRAW THE FIGURE. THIS HELP YOU CONCEPTUALIZE. ALSO, REFER AS OFTEN AS YOU NEED TO THE FORMULAS. REMEMBER, NOT ALL OF THE FORMULAS GIVEN WILL BE USED ON YOUR TEST. HOWEVER, IT'S BEST TO BE PREPARED!

SQUARE



P= 4s (s = side)
Area = s²

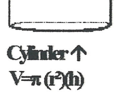
Perpendicular lines ⊥ = 90°



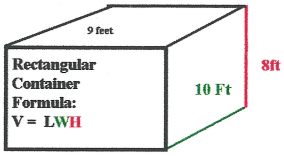
↙ A chemical drum has a height of 4 feet and a radius of 1 ½ feet. What is the volume? 3.14 x 1.5 x 1.5 x 4 V= 28.26 cubic feet or 28.26 ft.³ NOTE: Π (pi) = circumference divided by the diameter

Cylinder ↑
V=π (r²)(h)
r=radius
h=height

π=3.14...or 22/7

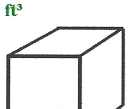


← A trapezoid is a quadrilateral.



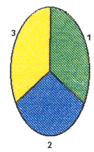
Volume = 3 dimensions = LENGTH (L) WIDTH (W) and HEIGHT (H) = 9 x 10 x 8 = 720 Cubic feet or 26.66 cubic yards {27 cubic feet = 1 cubic yard. 1728 cu. inches = 1 cu. ft or 1 ft³

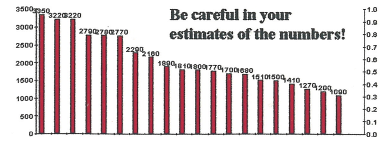
The Volume of a cube can be found by MULTIPLYING the length of one side times itself 3 times. For example, if the length is 60 cm, then V= 60x60x60 or 216,000 cubic feet or 216,000 ft.³



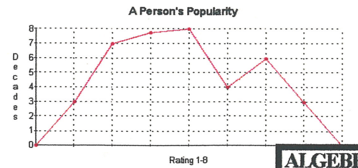
Cube
V=S³
s = side

Pie Charts divide the circle into various representative sections. It can graphically depict many variables. It sections represent fractional, decimal or percentages of a whole amount. Usually one of the sections is left without a number. To find it, add the other sections and subtract from 100. Commonly used with %.



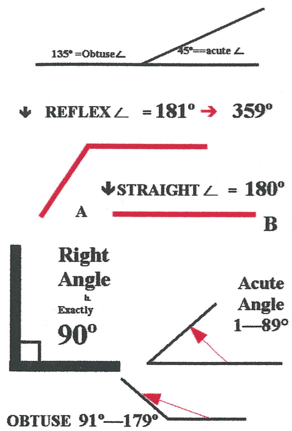


Bar Charts are another way of expressing data graphically. At the left are the amount of deaths by coronary heart disease (CHD) decline annually over a period of years. TIP: Always pay attention to the numbers "per million" or "per 100,000". To find the difference in the rate of CHD deaths between years you should subtract. "PER" means One.



A LINE GRAPH measures horizontally and vertically. Always read the titles and the measures. It usually measure 2 variables (bi-variate) over time like the bar graph. In this graph, a person's popularity has declined and risen and finally sunk to a new all-time low. (Must be a politician).

TIP: ASSOCIATE THE WORD "SUPPLEMENTARY" WITH 180° AND ANY STRAIGHT LINE OR HALF OF A CIRCLE



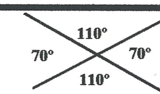
ALGEBRAIC EQUATIONS: OR SOLVING FOR THE UNKNOWN;

EX. BILL BOUGHT SOME BOOKS ON MONDAY. WHEN ADDED TO THE 8 HE ALREADY HAS THE TOTAL IS 13. HOW MANY DID HE BUY ON MONDAY?

x+8=13	x - 8 = 13	8x=24	x/3=8
x=13-8,	x = 13+8	x=3	x=24
x=5	x=21		

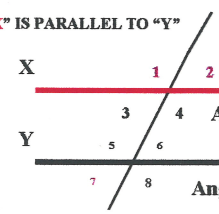
TO ANSWER AN EQUATION THAT HAS A VARIABLE LIKE "X" FIND THE NUMERICAL VALUE FOR THE LETTER. (EX.#1) USE THE INVERSE OR OPPOSITE OPERATION METHOD LIKE ABOVE. YOU CAN ALWAYS CHECK AN EQUATION TO SEE IF IT IS CORRECT! *LINEAR EQUATIONS:* THE STANDARD FORM OF A LINEAR (GRAPH) EQUATION IS" Y=MX+B. EX. Y=3X +2 3 = M = THE SLOPE, 2 = B = THE Y-INTERCEPT(WHERE THIS LINE WOULD CROSS THE Y AXIS). ALWAYS CHANGE AN EQUATION TO THE STANDARD FORM BEFORE GRAPHING! EX. 3Y = 6X - 9 WOULD BE Y = 2X -3 AFTER DIVIDING ALL THE TERMS BY "3". THE SLOPE WOULD BE "2" AND THE Y-INTERCEPT WOULD BE A "-3". PARALLEL LINES HAVE THE SAME SLOPE, WHEREAS, A LINE THAT IS PERPENDICULAR (90 DEGREE ANGLE) HAS THE NEGATIVE RECIPROCAL OF THE SLOPE OF THE SECOND LINE. SEE GRAPHS ↰INEQUALITIES < = LESS THAN -6 < 0 0 > - 6 GREATER THAN. ≤ LESS THAN OR EQUAL TO, ≥ GREATER THAN OR EQUAL TO.

Vertical Angles have equal opposite angles.→ The sum is always 360 degrees.



TRANSVERSAL ↘

"X" IS PARALLEL TO "Y"



Angles 1 & 5 are equal.
Angles 2, 3 are equal.
Angles 3,6 are opposite interior angles which are always equal.
Angles 1, 8 & 7,2 are opposite exterior and are always equal.

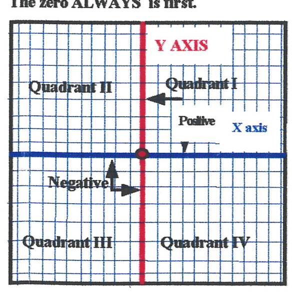
Most word problems involving angles use buildings and trees. Ex. Where the ceiling meets the floor forms a right angle. A midpoint of a right angle would be 45°. TIP: Draw a sketch of what is being described.

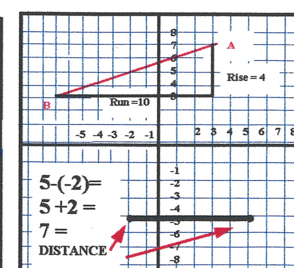
ELEMENTARY ALGEBRA: (30% OF TEST) THE ABSOLUTE VALUE USES THIS SYMBOL | | AND IS DEFINED AS THE DISTANCE A NUMBER IS FROM ZERO. ABSOLUTE VALUE IS POSITIVE UNLESS THERE IS A NEGATIVE SIGN PRECEDING THE ABSOLUTE VALUE SIGN - | -3 | = -3. SOME BOOKS PREFER TO TEACH THE ABSOLUTE VALUE METHOD OF LEARNING THE RULES OF INTEGERS...I DO NOT. MEMORIZE THESE RULES OF SIGNED NUMBERS OR INTEGERS: (1) IF THE SIGNS ARE ALIKE, ADD THE NUMBERS AND GIVE THE ANSWER THAT SIGN. EX. -4 + -3 = -7; 23 + 2 = 25 (2) IF THE SIGNS ARE DIFFERENT, FIND THE DIFFERENCE AND GIVE THE ANSWER THE SIGN OF THE LARGEST NUMBER. EX. -5 +2 =-3, 5 + (-2) = 3 NOTE: IF A NUMBER DOES NOT HAVE A SIGN IT IS UNDERSTOOD AS BEING POSITIVE! STRATEGY A: ENVISION THE NUMBER LINE OR A THERMOMETER TO GET YOUR ANSWER OR STRATEGY B: IMAGINE YOU ARE TRYING TO BALANCE YOUR CHECKBOOK. EVERY NEGATIVE IS A CHECK/DEBIT AND EVERY + IS A DEPOSIT/CREDIT. RULE #3: SUBTRACTION: ALWAYS CHANGE THE SIGN OF THE NUMBER BEING SUBTRACTED (THE SECOND NUMBER) AND THEN FOLLOW THE RULES 1 & 2 FOR ADDITION. EX. -9 - (-2) = -9 +2 = -7 OR 9 - (2) = 9 - 2 = 7 STRATEGY C: SINCE YOU ARE SUBTRACTING YOU ARE STILL FINDING THE DIFFERENCE BUT NOW ITS WITH POSITIVE AND NEGATIVE NUMBERS. ASK YOURSELF HOW FAR (DIFFERENCE) IS A -9 FROM A -2? (-7) RULE 4/5:*MULTIPLICATION & DIVISION:* IF THE SIGNS ARE ALIKE, ITS POSITIVE(2 NUMBERS). IF THE SIGNS OF 2 NUMBERS ARE DIFFERENT, IT'S NEGATIVE. EX. (-5)(-2) = +10 OR (-3)(4) = -12 -15/3 = -5 WHEREAS -18/-3 = 6. RULE 6: WHEN MULTIPLYING SEVERAL NUMBERS IF YOU HAVE AN EVEN NUMBERS OF NEGATIVE SIGNS YOUR ANSWER IS POSITIVE. AN ODD NUMBER OF NEGATIVE SIGNS IS ALWAYS NEGATIVE. EX. (-3)(2)(-4) = +24 WHEREAS (-3)(-2)(-4) = -24. POWERS: 4²=(4)(4)=16 2³= (2)(2)(2) = 8 5³ = (5)(5)(5)=125. IF YOU ARE WORKING WITH FRACTIONS THE SAME IS TRUE ¾ ² (¾ TO THE SECOND POWER OR ¾ X ¾ = 9/16. STRATEGY: MEMORIZE THE SQUARES OF THE FIRST 15 NUMBERS TO EXPEDITE THE PROCESS. ROOTS: YOU WILL USE THE PRINCIPLE SQUARE ROOT SYMBOL √ WHICH IS THE OPPOSITE OF SQUARING A NUMBER. EXPRESSIONS: LIKE FORMULAS, JUST SUBSTITUTE THE NUMBER FOR THE VARIABLE (X).EX. 7(A)(B) -B WHEN A=3 AND B=2 7(3) -2=21-2 = 19. YOU DON'T HAVE TO REMEMBER THE FORMULAS ON THE GED THEY WILL BE GIVEN AS REFERENCE. EQUATIONS: SHOULD BE THOUGHT OF AS A SCALE OR BALANCE. AN EQUATION HAS A LEFT AND RIGHT SIDE WITH THE = IN THE MIDDLE. DO THE INVERSE OR OPPOSITE OPERATION WHEN GROUPING ALIKE TERMS SUCH AS 2X AND 3X AND 4 AND -3. TIP: ANYTIME YOU TAKE A VARIABLE FROM ONE SIDE OF THE EQUATION TO THE OTHER, YOU ALWAYS CHANGE THE SIGN OF THAT NUMBER OR VARIABLE. (SEE ABOVE NEXT COLUMN↗). POLYNOMIALS: (MANY NUMBERS) ARE GROUPS OF NUMBERS AND VARIABLES. GENERALLY, THEY ARE WRITTEN IN DESCENDING ORDER RANKED BY THE HIGHEST POWER TO THE LOWEST. FOR EXAMPLE, 3X² + 2X + 4 THE DEGREE IS 2. THE COEFFICIENT IS THE NUMBER IN FRONT. THE COEFFICENT OF 3X² IS 3 AND THE COEFFICIENT OF 2X IS 2. THE COEFFICIENT OF A VARIABLE WITH NO NUMBER LIKE Y OR X³ IS ALWAYS 1. YOU CANNOT COMBINE VARIABLE UNLESS THEY HAVE THE SAME TERMS AND DEGREE. EX. 3X² + 5X CANNOT BE COMBINED. POLYNOMIALS FOLLOW THE SAME ABOVE RULES FOR INTEGERS. EX. -2X+ 5X= 3X, 5A²+A² = 6A². MOST OF THE ALGEBRA INVOLVES "SET-UP" QUESTIONS...YOU HAVE TO BE ABLE TO TELL "HOW" SOMETHING WOULD BE CALCULATED. "X" IS THE UNKNOWN. MAKE IT KNOWN! THAT'S THE ANSWER!

X	X^2	X	X^2
1	1	2	4
3	9	4	16
5	25	6	36
7	49	8	64
9	81	10	100
11	121	12	144
13	169	14	196
15	225	16	256
20	400	25	625
30	900	35	1225

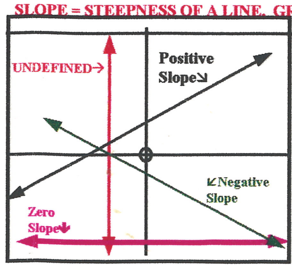
CARTESIAN COORDINATE SYSTEM : 2 DIMENSIONAL: Y AND X

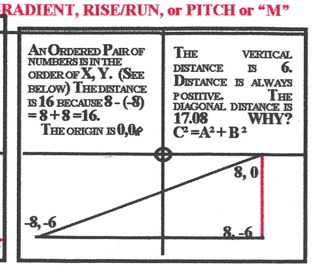
The X-intercept is where a line crosses the X axis Ex. (6, 0)The zero is ALWAYS second. The Y -intercept is where the line crosses the Y axis. Ex. (0, 5) The zero ALWAYS is first.





SLOPE = STEEPNESS OF A LINE, GRADIENT, RISE/RUN, or PITCH or "M"





Slope formula: $M = \frac{Y_2 - Y_1}{X_2 - X_1}$ The numbers below x & y are subscripts nd used to distinguish between the first and second Ordered pairs. They are not exponents.

FINAL NOTE:

THERE IS NO SUBSTITUTE FOR STUDYING MATH...NOT JUST TO PASS A TEST BUT TO TRULY LEARN IT. EXPECT TO MAKE MISTAKES BUT YOU SHOULD LEARN FROM THEM. PATIENCE, DISCIPLINE, AND DETERMINATION ARE THE KEYS TO LEARNING MATH. REMEMBER, THERE IS NOTHING IN THIS WORLD YOU CAN DO THAT DOESN'T INVOLVE MATH. MASTER EACH LEVEL BEFORE PROCEEDING. USE A CALCULATOR, COMPUTER AND VIDEOS AS SUPPLEMENTS IN YOUR EXPLORATION.

BEST OF LUCK!
G. ANDREW PAGE

Member † NCTM & AMA.