## Math

**4 types of Questions:**

1. Problem Solving - multiple choice
2. Multiple Answer - Multiple choice with multiple correct answer choices
3. Numeric Entry - no answer choices provided
4. Quantitative Comparison - 4 answer choices to choose from (A is larger, B is larger, the 2 are equal, solution can't be determ-ined)

## Mental Math Tips:

**Dividing by 5:** Double the # you want to divide, then divide this number by 10.

**Quick mental multiplication:** If multiplying with a large number, factor a 2 out of the large number and multiply it by the smaller number. Factoring out the 2 numbers you want to multiply can help simply the calculation. Ex) 260 x 15 = (2)(15)(130) = (30)(10)(13)=(3)(10)(10)(13)= 3900}}

**Squaring Shortcuts:**

1. Multiples of ten: square the non-zero part of the number you want to square
2. Numbers ending in 5: The last 2 digits of the square will always be 25; remove the 5 and add 1 to the remaining digit (n), find the product of this number (n+1) and the non-five number (n)
3. Figuring out the square of (n+1): If we know $n^2$, $(n+1)^2 = n + (n+1) + n^2$

**Multiples of 10:**

If multiplying by 10: move decimal to the right

If dividing by 10: move decimal to the left

## Mental Math Tips: (cont)

Numbers can't be divided by 0

0 divided by any number = 0

## Quantitative Comparison

**Strategies:**

1. You will only ever need to be able to estimate solutions; use math to simplify relationships between the 2 choices presented
2. Add or subtract X to both choices
3. Multiply or divide by a positive number
4. You can decrease numerator or increase denominator to simplify fractions for estimation

## Rounding

There is an infinite quantity of numbers between any 2 numbers on a number line.

## Integer

A number written without a fractional component {nl}} Ex) 21, 0, -2100

Examples of non-integers: 9.75, 5 1/2, $2^{1/2}$

## Properties of Real Numbers

Assume a number is real if the questions refers to a "number".

**Real Number:** all numbers on the number line (positive, negative, or zero); can also include decimals

**Zero:** is neither positive or negative; the absolute value of zero = zero

**Absolute value:** the distance of a number from zero (origin on the number line)

## Order of Operations: PEMDAS

**Grouping Symbols:** parentheses, brackets, square root sign, long fraction bar, exponents written as equations (ie $x^{y+7}$)

## Word Problems

**Key Words:**

1. Is = equals
2. Of = multiply

## Data Interpretation

1. Read all relevant text.
2. Look at axis labels
3. Look for trends in data: Repeated patterns, highs vs lows, increase vs decrease
4. Pay attention to units mentioned in the question: they might not match the units on the graphs!

**Types of graphs:**

1. Pie chart - usually paired with another chart
2. Line graph: usually has a horizontal axis (time)
3. Bar graph: bars will usually represent a category or interval of time
4. Scatter plot: used when each data point can be described by 2 numerical measurements. Positive correlation: if 1 variable increases, then the other will too.

**Profit = Revenue - Loss**

## Remainder Problems

If the dividend is less than the divisor, then the remainder will be equal to the dividend. This is always the smallest positive dividend with this remainder.

## Percents

The test likes to ask about % increase or decrease.

**Simple interest:** Unlikely to asked on test, but useful for making estimations. Concept where interest only paid on principle. Numbers will rise on a constant slope.

**Compound Interest:** Interest paid on principle & interest previously accrued. No 2 consecutive payments will be the same.

Ex) $1000 deposited into account with 5% compound interest.
Year 1 = $1000(1.05) = $1050
Year 2 = $1050(1.05) = $1102.50

## Ratios

When presented with a ratio problem, find a common variable between the 2 ratios.



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