

# TIPS & STRATEGIES



## 1. The GMAT is Adaptive.

This means the questions get harder or easier depending on whether your answer is correct or incorrect. Your score is not directly determined by how many questions you get right, but on how hard the questions are. You want to answer as many hard questions as possible. This is the reason to concentrate on the earlier questions so you can get harder questions which are worth more points.

## 2. Process of elimination and skipping.

Skipping isn't allowed on the GMAT, you have to answer the question to move on to the next one. If you can't answer a question, you have to guess to move on. Use **process of elimination** to identify the wrong answers so you can focus on the possible right answers

## 3. Finish the GMAT.

Answer all questions on the test even if you have to guess to finish as you run out of time at the end; this is because there is a penalty for unanswered questions on the GMAT. Every question left unanswered will decrease your score by a greater amount than a question that you answered incorrectly.

# NUMBERS & OPERATIONS

## INTEGERS

Integers are all whole numbers & their negative (including zero) e.g. -2, -1, 0, 1, 2, 3  
Integers do not include fractions & decimals.  
Zero is neither a positive or negative integer.

## CONSECUTIVE INTEGERS

Consecutive integer expression:  
 $n, n+1, n+2$  ( $n = \text{any integer}$ )  
Consecutive **EVEN / ODD** integer expression:  
 $n, n+2, n+4$  ( $n = \text{any even/odd integer}$ )  
The average of a consecutive set of numbers is the middle number  
 $10, 11, 12, 13, 14$   
When you divide the sum of a consecutive set by the number of values, the result is the middle number = AVERAGE  
 $5 + 6 + 7 + 8 + 9 = \frac{35}{5} = 7$

## PRIME NUMBERS

A **prime number** is a positive integer greater than 1, which is only divisible by itself & 1. The number 1 itself is not a prime number.  
Examples are 2, 3, 5, 7 ...  
NOTE: 2 is the first & only even prime number

## FACTORS & MULTIPLES

FACTOR	MULTIPLE
$2 \times 2$	$= 4$
$2 \times 3$	$= 6$
$2 \times 4$	$= 8$

## RATIO & PROPORTIONS

The following forms are all the same:

FRACTION	RATIO	RATIO
$\frac{2}{5}$	2 : 5	2 to 5

The percent sign (%) means divided by 100;  
hence  $56\% = \frac{56}{100}$

**Proportion** is when two ratios are set equal to one another:  
 $\frac{x}{2} = \frac{9}{3}$

When two ratios equal to one another (proportion), use cross multiplication to find the unknown variable. Using the above example:  
 $3x = 18$   
 $x = 6$

This "prep sheet" has been designed as a quick reference source while preparing for the GMAT Math exams. Success Prep in no way condones cheating, therefore this prep sheet is to be used only as a study guide and is not to be taken into the GMAT exam.

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# ALGEBRA REVIEW

## COMBINING VARIABLES

adding, subtracting, multiplying, dividing  
When adding or subtracting a variable, add or subtract the **coefficient** (number in front) of the variable.

$a + a = 2a$	$a \times a = a^2$
$ab + ab = 2ab$	$ab \times ab = a^2b^2$
$a + c = a + c$	$a \times c = ac$
$a^2 + a^3 \neq a^5$	$a^2 \times a^3 = a^5$
$b^9 - b^2 \neq b^7$	$\frac{b^9}{b^2} = b^7$

### Examples:

$4^{17} - 2^{28}$	$2^2 + 2^2 + 3^6 + 3^6 + 3^6$
$= 2^{2(17)} - 2^{28}$	$= 2(2^2) + 3(3^6)$
$= 2^{34} - 2^{28}$	$= 2^3 + 3^7$
$= 2^{28}(2^6 - 1)$	

## ALSO REMEMBER...

$a^0 = 1$  (Anything with a zero exponent is equal to 1)

$$m^{-5} = \frac{1}{m^5} \quad m^{\frac{x}{y}} = (\sqrt[y]{m})^x \quad n^{\frac{1}{2}} = \sqrt{n}$$

## FACTORING

Difference of two squares:

$$a^2 - b^2 = (a + b)(a - b)$$

F.O.I.L. (First-Outer-Inner-Last)

$$(a - b)^2 = (a - b)(a - b)$$

$$(a + b)^2 = (a + b)(a + b)$$

$$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

NOTE:  $(a - b)^2$  is **NOT** equal to  $(a^2 - b^2)$

## WORD PROBLEMS - Translating word problems into math equations

WORDS	SYMBOL	EXAMPLE	EQUATION
is, was, has	=	Eva is the same age as Wall-E.	$E = W$
more than, older than, sum of	+	Eva has four <b>more</b> cookies <b>than</b> Wall-E	$E = 4 + W$
less than, differences, fewer than	-	Eva is 50 centimeters <b>less than</b> Wall-E's height	$E = W - 50$
of, product	x	Eva ate $\frac{2}{5}$ of the cake.	$E = \frac{2}{5} \times C$
for, per	/	The car was travelling 20 miles <b>per</b> hour.	$20 \frac{\text{miles}}{\text{hour}}$
what percent	$\frac{x}{100}$	What percent of 50 is 10	$\frac{x}{100} \cdot 50 = 10$

**EXTRA TIPS...** Assign variables to each person or object compared or identified in the problem using the first letter of the person's (or object's) name.

**Also Remember** If  $0 < X < 1$  i.e 0.75  
 $(0.75)^2 < \sqrt{0.75}$

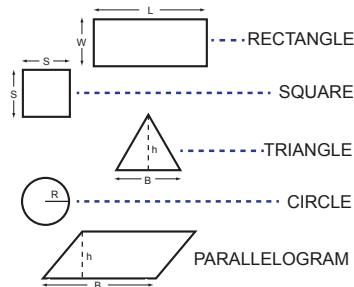
But  $X > 1$  i.e 2.5  
 $(2.5)^2 > \sqrt{2.5}$

$$\sqrt{2} = 1.4$$

$$\sqrt{3} = 1.7$$

## GEOMETRY REVIEW

AREA, PERIMETER, VOLUME



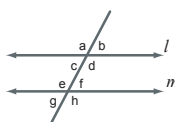
SHAPE	AREA (A)	PERIMETER (P)	VOLUME (V)
RECTANGLE	$A = L \times W$	$P = 2L + 2W$	$V = LWH$ of prism
SQUARE	$A = S^2$	$P = 4S$	$V = S^2 H$ of prism
TRIANGLE	$A = \frac{1}{2} B h$ of triangle	$P = S + S + S$ (sum of all sides)	$V = \frac{1}{2} B h H$ of prism
CIRCLE	$A = \pi R^2$	$C = 2\pi R$	$V = \pi R^2 H$ of prism
PARALLELOGRAM	$A = B \times h$ of parallelogram	$P = S + S$	$V = B h H$ of prism

## ANGLES & TRIANGLES

REMEMBER:

Sum of angles on a line =  $180^\circ$   
 Complementary angles: sum =  $90^\circ$   
 Supplementary angles: sum =  $180^\circ$   
 Sum of all angles in a triangle =  $180^\circ$

### PARALLEL LINES

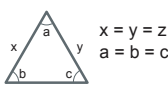


Lines  $l$  and  $m$  are parallel.

Vertical angles:

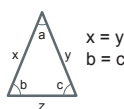
$b = c$   $a = e$   $d = e$   
 $a = d$   $c = g$   $c = f$   
 $f = g$   $b = f$   $a = h$   
 $e = h$   $d = h$   $b = g$   
 Hence, angles  $a, d, e, h$  are equal & angles  $b, c, f, g$  are equal.

### EQUILATERAL TRIANGLE



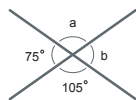
$x = y = z$   
 $a = b = c$

### ISOSCELES TRIANGLE



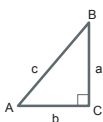
$x = y$   
 $b = c$

### VERTICAL ANGLES



$a = 105$   
 $b = 75$   
 $a + b = 180^\circ$

### RIGHT TRIANGLES & PYTHAGOREAN THEOREM



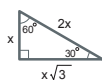
$c =$  hypotenuse (longest side of a right triangle)  
 $a$  &  $b$  are called "legs"

Pythagorean Theorem:

$$a^2 + b^2 = c^2$$

### OTHER RIGHT TRIANGLE RULES

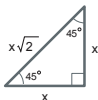
30 - 60 - 90 Rule



Other Pythagorean Triples

7-24-25  
 8-15-17

45 - 45 - 90 Rule



## SLOPES, POINTS, & LINES

### MIDPOINT FORMULA

$$x_{\text{midpoint}} = \frac{(x_1 + x_2)}{2}$$

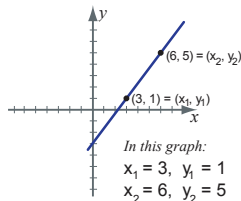
$$y_{\text{midpoint}} = \frac{(y_1 + y_2)}{2}$$

Example:

Given points (3,1) & (6,5)

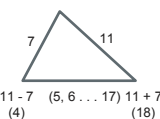
$$x_{\text{midpoint}} = \frac{(3 + 6)}{2} = 4.5$$

$$y_{\text{midpoint}} = \frac{(1 + 5)}{2} = 3$$



In this graph:  
 $x_1 = 3, y_1 = 1$   
 $x_2 = 6, y_2 = 5$

### Length of 3rd side of a Triangle



### SLOPE FORMULA

$$\text{slope of a line: } m = \frac{(y_2 - y_1)}{(x_2 - x_1)} = \frac{\Delta y}{\Delta x} = \frac{y}{x} = \frac{\text{Rise}}{\text{Run}}$$

Example:

Given points (3,1) and (6,5)

$$m = \frac{(5 - 1)}{(6 - 3)} = \frac{4}{3}$$

### EQUATION OF A LINE FORMULA

$$y = m(x) + b$$

$m =$  slope of the line  
 $b =$  the  $y$  intercept of the line

### POLYGONS

Sum of interior angles of a Polygon:  
 $(n-2) \times 180^\circ$  ( $n =$  the number of sides)

Example: For a heptagon,  $n = 7$   
 $(7-2) \times 180^\circ = 900^\circ$

## STATISTICS & PROBABILITY

### ARITHMETIC MEAN (AVERAGE)

$$\text{Average} = \frac{\text{Sum}}{\text{Number}}$$

### MEDIAN

The middle value in increasing or decreasing order.

Example:

2, 3, 4, 5, 7 median = 4

2, 3, 4, 5 median =  $\frac{3+4}{2} = 3.5$

### MODE

The most frequently occurring value.

Example:

1, 3, 3, 4, 5, 3, 7

mode = 3

### SPEED-DISTANCE-TIME



### FRACTIONS & PROBABILITY

$$\text{Fraction} = \text{Probability} = \frac{\text{Focus}}{\text{Total}}$$

Example:

{2, 3, 5, 7, 10, 13}

Fraction / Probability of selecting an odd number from the set above is:

$$\frac{4}{6} \text{ (}\# \text{ of odd values)} \\ \frac{2}{3} \text{ (Total \# of values)}$$

### COMBINATION

$n =$  total  
 $c =$  combination  
 $r =$  focus

$${}^n C_r = \frac{n!}{(n-r)! r!}$$

### PERCENTAGE

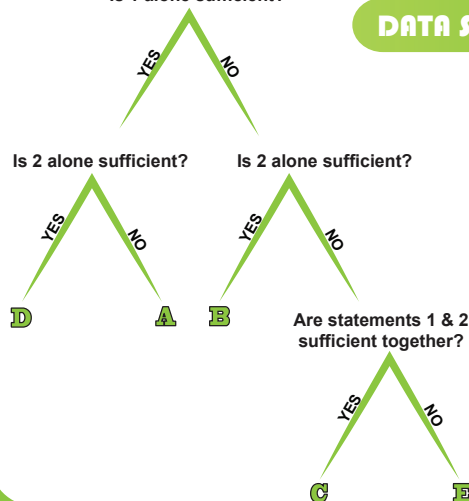
$$\text{What \% of} = \frac{\text{Focus}}{\text{Total}} \times 100$$

$$\text{Percentage Increase} = \frac{\text{Increase}}{\text{Original}} \times 100$$

$$\text{Percentage Decrease} = \frac{\text{Decrease}}{\text{Original}} \times 100$$

Is 1 alone sufficient?

## DATA SUFFICIENCY



## Tips & Strategies

- Do not waste time solving the problem.
- First consider each statement separately
- Answer the question being asked
- Statement 1 & 2 are statements of fact and will always be true.