Tutoring Solutions Group

K-12 Tutoring/SAT & ACT Prep

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SAT Math-Reminders

- $V(cylinder) = \pi r^2 h \; and \; V(cone) = \frac{1}{3}\pi r^2 h$

- $Percent \; change \; formula = \frac{New - Old}{Old} * 100$

- Review 45-45-90 and 30-60-90 right triangles.

- Pythagorean triples: 3,4,5 | 5,12,13 | 7,24,25 | 8,15,17

- If sin(x)=cos(y) and x and y are acute, then x+y=90

- For projectile motion problems, at max height velocity and acceleration are zero.

- Radians and degrees-set up a proportion.
  Example: How many radians are in 270 degrees?
  - Recall. There are 180 degrees in π radians.

$$\frac{\pi}{180} = \frac{x}{270}$$
$$270\pi = 180x$$
$$x = \frac{3}{2}\pi$$

- What is the formula to graph a circle? $(x-h)^2 + (y-k)^2 = r^2$
  - Center: (h,k) and radius is r

- You will probably see many parabola questions. There are two formats for parabolas.
  1. $y = ax^2 + bx + c$

$Vertex: x = -\dfrac{b}{2a}$

$Number \; of \; real \; solutions$

$If \; b^2 - 4ac = 0$, there is one real solution.
$If \; b^2 - 4ac < 0$, there are no real solutions.
$If \; b^2 - 4ac > 0$, there are two real solutions.

$2. \; y = a(x-h)^2 + k. \; This \; is \; callled \; VERTEX \; form$
$The \; vertex \; is \; (h, k)$. If a>0, the parabola opens up and has a minimum. If a<0, the parabola opens down and has a maximum.
$REMEMBER$: Real solutions are where the function crosses the x axis (where y equals zero).
Solutions are the same as roots, which are the same as zeroes.

- What is slope? RATE of CHANGE

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$Suppose \; that \; SAT \; score \; depends \; on \; GPA \; and \; SAT(GPA) = 1050 + 45(GPA)$
Interpret the slope: When GPA goes up by one point, SAT score rises by 45.
Interpret the y intercept: Even when GPA is zero, SAT score is still 1050.

- What is magnitude of rate of change? Absolute value of slope

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Probability and Statistics

How is probability defined? The probability of a success is defined as the number of successes divided by the total

	SAT Score		
	Low	Medium	High
Tutoring Hours			
15	15	6	1
20	12	17	3
25	3	14	18
30	1	15	22

1. Sam is one of the students described in the table above. If Sam has a Medium SAT score, what is the probability that he had 25 or 30 hours of tutoring? (29/52)
2. For those who had less than 25 hours of tutoring, what proportion had a high SAT score? (4/54)
3. If a student is randomly selected, what is the probability that he had either a low score and/or 15 hours of tutoring? (38/127)

What is standard deviation? Standard deviation measures the spread of the data.

Median: middle number

Locating the median-when n (the number of elements is odd), the median is located at the (n+1)/2

number. When n is even, the median is the average of the (n/2) and ((n/2)+1) numbers.

Mode: most frequent/repeated number

Range: Largest number-smallest number

Mean: AVERAGE=sum/n

Growth Problems:
For LINEAR GROWTH, y always changes by the same amount when x changes by the same amount.
Example: Each successive year, $100 is added to the value of the account.

For EXPONENTIAL GROWTH, y increases by more and more as x increases by the same amount.
Examples: A stock doubles in value every year.
Each successive year, 1% of the current value is added to the value of the account

Distance formula: $D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Quadratic Formula: $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

When two lines or curves INTERSECT, set the equations equal.

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SAT Writing and Language

✓ For questions that ask you to re-order the sentences in a paragraph or pick a sentence that summarizes a paragraph, make sure you re-read the ENTIRE paragraph.

There are 3 ways to separate 2 full sentences
1. Period
2.   ,FANBOYS
3. Semicolon or colon

Review of comma usage

1. These are all acceptable sentences.
   - Harry, travelling to the tutoring session, received a call.
   - Harry received a call, travelling to the tutoring session.
   - Travelling to the tutoring session, Harry received a call.
   - Sam, however, hates math.

2. NO comma before that

   - We all know that Ramaz is a great school.
   - My dog that is sitting in the yard is a golden retriever.
   - He found out that the public preferred live magic acts to filmed versions.

3. Use a comma before which.
My dog, which runs to catch the yellow ball, loves to eat.

4. Use a comma for by the way statements.

He found out, for example, that the public preferred live magic acts to filmed versions.
He found out, therefore, that the public preferred live magic acts to filmed versions.
He found out, however, that the public preferred live magic acts to filmed versions.

5. Subject/Verb agreement.

- Replace singular subjects with "it." Replace plural subjects with "they."
- Our technologically advanced times have allowed filmmakers to be creative.
  What is the subject? Times. Times is plural replace with they | They-have allowed
- The group of exceptional athletes has/have performed better than expected this year.
  group-singular| replace group with it | it has....
- The field of Republican candidates continues/continue to become narrower.
  field...singular
  it continues

SAT Reading-Word Lists

Words of the week!	
Latent	Hidden
Conspicuous	Visible
Binary	2 parts
Caveat	A limitation on an argument
Qualify (v)	To put limitations on an argument
Ellipsis	Omission in a sentence (***)
Cluster	To group
Disjoint	Not going together
Empirical	From evidence or experiments
Deterministic	Process where final state is completely predicted by initial state
Extraneous	Extra (not needed)
Interpolate	To estimate reasonably
Extrapolate	To estimate unreasonably
Residual	Left over
Skewed	Biased
Impartial	Fair
Acoustic	Related to sound
Embed	To enclose or insert (embed an idea into someone's mind)
Relegate	To put to a lower position

Latin Phrases High School Students Should Know	
Ex post	After the fact
Persona non grata	An unwelcome person
Ex ante	Before the fact
Carpe diem	Seize the day/of the day
A posteriori	Relating to observed facts
Dues ex machina	From Gd, Machine
Ceteris paribus	Holding all else constant
A fortiori	For a stronger reason
Habeus corpus	Of the body (a legal requirement that a defendant has a right to a jury)
A priori	Known through facts
Ante diluvian	Before the flood
Ante bellum	Before the war
Bona fida	Genuine/real
Ante meridiem	Before midday (a.m.)
Mea culpa	Through my own fault
Vice versa	The other way around
E Pluribus Unum	Out of many, one
Post meridiem	After midday (p.m.)
Veni vidi vici	I came-I saw-I conquered

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SAT Words-New SAT	
Seminal	Found work/first important work of an author, painter, etc...
Implicit	Not directly stated
Tacit	Not directly stated
Explicit	Directly stated
Commission (v)	To authorize or give an order
Commence	To begin
Surly	Rude/unfriendly
Abysmal	Terrible
Empirical	Evidence based
Heuristics	Guess and check, trial and error, rules of thumb, mental shortcuts
Obscure	Weird
Static	Not changing or moving
Apprehensive	Worried/concerned about
Ambivalent	Unsure/hesitant
Brevity	Briefness
Prominent	Famous, well known
Depleted	Emptied
Replete	Full
Promulgate	To make well known

SAT Words-New SAT	
Veiled	Hidden
Galvanize	To spur/excite to action
Yield	To give way to
Coarse	Rough/not elegantly stated
Qualify a claim	To state the limitations of an argument
Treachery	Disloyal
Dreary	Sad/gloomy
Malleable	Flexible
Freewheeling	Off the cuff
Employ	To use
Frank	Honest/open
Mediation	Going between two sides
Anecdote	An example of short story used to illustrate a point
Precedent	An preceding example
Unprecedented	Never been done before
Substantiate	To support with evidence
Feasible	Possible/Able to be done
Solidarity	Togetherness
Conducive	Helpful to a cause

SAT Words-New SAT	
Sequester	To isolate
Austere	Serious/severe
Egregious	Very bad
Withstand	To handle hardship
Thaw	To defrost
Opine	To give an opinion on
Mitigate	To lessen
Proclaim	To state strongly
Pragmatic	Practical
Skeptical	Questioning
Dubious	Doubtful
Egregious	Very bad
Systemic	Affecting an entire system
Entrenched	Established solidly
Resigned	Given up to something
Blatant	Obviously stated
Scapegoat	One person is unfairly blamed for a problem
Brusque	Shortness/Rudeness
Brash	Offensively bold