SAT WORKSHOP

BOBBY KENNEY

FIRST, THANK YOU!

LOGISTICS

- End @ 11
- Devices
- Session 2 next Saturday 3/9 @ 9am
- Free practice test Saturday 3/30 @ 9am
- (Final) Session 3 Saturday 4/13 @ 9am

WHO I AM

- Bobby Kenney
- Harvard Class of ‘10 (Chemistry & Spanish)
- National Merit Scholarship semi-finalist; scored 1590 on paper SAT; three times scored 36 on ACT; scored 5 on 8 AP exams
- Private tutor in Denver

TODAY'S GOALS

- Understand the digital SAT
- Review standardized testing
  - Why do we take these tests?
  - SAT vs ACT
- Optimize our Reading process
  - Conquer "Notes" questions
- Learn about Math section
  - Practice with Desmos (time permitting)

MUCH OF COURSE WILL BE HANDS ON

PART I

SAT OVERVIEW

HOW MANY OF YOU ARE JUNIORS? SOPHOMORES? OTHER?

HOW MANY OF YOU HAVE TAKEN THE SAT BEFORE? PSAT?

THE SAT IS IDENTICAL TO THE PSAT

THE PAPER SAT/PSAT IS GONE

SAT/PSAT ESSENTIAL STATS

- 2 sections with 2 modules each
  - Reading & Writing
    - Two 32-minute modules with 27 questions each (54 total questions)
    - Short, independent passages with 1 question each
  - (10-minute break)
  - Math
    - Two 35-minute modules with 22 questions each (44 total questions)
    - YOU CAN USE DESMOS!!!
  - Totals: 98 questions in 2 hr 14 min

SAT/PSAT ESSENTIAL STATS, II

- Second module of both sections is adaptive
  - You will face either an easier or a harder set of questions, depending on performance on Module 1
    - ~470-530 per section is cut off between easier and harder second module
  - Getting the harder second module means your score potential is higher
  - Module 2 may present timing difficulties
  - Do as well as you can no matter what
    - Don’t try to get the easy second module, or your score will be lower

SAT/PSAT ESSENTIAL STATS, III

- Scored out of 1600 points
  - Average score: 1060
- 89% of test is multiple choice
  - All multiple-choice questions have 4 answer choices
  - There is always only 1 correct answer
- ~11 math questions are student-produced response
  - Sometimes, a range of answers can be correct
  - These can have a negative answer
  - Answers accept up to 5 characters

WHY DO WE TAKE STANDARDIZED TESTS?

- Admission to colleges, especially selective schools/programs
  - Only the ACT and SAT can be submitted, not the PSAT
  - You can decide which scores to send (and which not to send)
  - All colleges that accept tests will accept either ACT or SAT
  - Both tests can be “superscored”
    - Highest individual section scores are added together
    - Each college determines whether it accepts a superscore or only takes the highest composite
  - Easiest aspect of your application to improve
- Scholarship opportunities
  - School scholarships
  - National Merit Scholarship
- Show that Columbine is doing a good job!

SAT TEST DATES

- April 17 & 18: SAT/PSAT here at Columbine
- March 9
- May 4
- June 1
- Anticipated test dates on August 24, October 5, November 2, and December 7
- October 2024 PSAT/NMSQT can qualify then-juniors (current sophomores) for National Merit Scholarship

ACT vs SAT

- You can take both tests
- You can *re*take both tests (several times)
- Both tests are accepted by colleges

SAT

- 98 questions
- 2 hr 14 min
- Only digital
- Reading/Writing, Math
- Harder questions, but more time

ACT

- 215 questions
- 2 hr 55 min
- Either paper or digital
- English, Math, Reading, Science
- Easier questions, but less time

ACT vs SAT

ACT might be better if:

- You get extended time (as part of an IEP or 504)
- You do not struggle with time management on tests or are a “quick processor”
- You struggle with math or are strong in language arts
- You prefer a paper test

SAT might be better if:

- You struggle with time management on tests
- You excel in math (math is half of the SAT vs a quarter of the ACT)
- You prefer a shorter and/or digital test

ACT TEST DATES

- April 13
- June 8
- July 13
- Anticipated test dates in September, October, and December

NATIONAL MERIT SCHOLARSHIP (NMS)

- The National Merit Scholarship is a prestigious program that can qualify you for significant money
  - NMS offers its own scholarship, but you can get corporate-sponsored scholarships and scholarships from schools
- Can also open doors for admissions to college
- National Merit Scholarship is tied to **junior-year *October* PSAT (not this upcoming one!)**
- Must score at or above an annually determined cutoff on the PSAT/NMSQT, which is ONLY given October of junior year
  - This cutoff changes from year to year but is approximately 1450

CALCULATING SELECTION INDEX

$$\frac{2RW + M}{10} = \text{Selection Index Score}$$

Examples:

- R/W=700, Math=670, SI=(2*700+670)/10=207
- R/W=760, Math=640, SI=(2*760+640)/10=216
- R/W=700, Math=760, SI=(2*700+760)/10=216
- R/W=760, Math=760 SI=(2*760+760)/10=228

SELECTION INDEX CUTOFF SCORES

- Specified by state
  - Class of 2024: 216
  - Class of 2023: 217
  - Class of 2025: ???
- If you reach this level, you will achieve recognition
  - Approximately 50,000 students are recognized yearly
  - Then you will enter a competition, where academic prowess is a factor

5 SIMPLE STRATEGIES FOR SAT

1. *Practice! There are 4 official practice tests available*
   - Khan Academy has free, official SAT-prep course
2. USE DESMOS AS MUCH AS POSSIBLE!
3. Never leave a question blank
4. Guess on difficult questions, flagging them to return with extra time
5. Instead of always searching for the right answer, eliminate 3 wrong answers

DAY BEFORE THE TEST

1. Gather things you need for the test
    - Admissions ticket (not necessary for April 17/18 test at Columbine)
    - ID (not necessary for April 17/18 test at Columbine)
    - Computer + charger
    - Calculator
        - TI-84 is most commonly used calculator
    - Layers
    - Water
    - Snacks

DAY BEFORE THE TEST

2. Review where you are going, and set an alarm
    - Get to testing center at 7:45 (for Saturday exam)
3. Screen off 1 hour before bedtime
4. Relax… go for a walk? Hang out? Watch a show?
5. Think happy thoughts!
    - Picture yourself going through the 4 modules
    - Understand you will encounter hard problems, especially on second modules of each section

PART II

BLUEBOOK APP

TOP TIPS

- Immediately toggle the answer eliminator
- Always pick an answer before moving on, but mark for review if needed
- Learn to resize text
  - Zoom in/out: ctrl + / ctrl - (cmd + / cmd - on Mac)
  - Slide divider left and right to expand text/question and answer choices
  - Bigger screen is better
- Hide the clock if needed
- In math, USE DESMOS!!!
  - Touchscreen helpful for zooming just one axis
- In math, access the reference guide
- Download the app today and take a practice SAT/PSAT test to familiarize yourself

PART III

READING AND WRITING

ORDER OF QUESTIONS

Questions always go in this order:

1. Vocabulary (2-4 questions)
2. Reading comprehension (10-12 questions)
    a. Question types: main idea, draw conclusions, function of underlined portion, interpret data, scientific inference
3. Grammar (7-9 questions)
    a. Question types: subject-verb agreement, pronoun choice, punctuation, modifier placement, apostrophes
4. Transitions (1-4 questions)
5. Rhetorical synthesis (2-5 questions)
    a. New question type!

ORDER OF QUESTIONS

Do the questions in this order:

1. Vocabulary (2-4 questions)—1st
2. Reading comprehension (10-12 questions)—SKIP (5th)
    a. Question types: main idea, draw conclusions, function of underlined portion, interpret data, scientific inference
3. Grammar (7-9 questions)—2nd
    a. Question types: subject-verb agreement, pronoun choice, punctuation, modifier placement, apostrophes
4. Transitions (1-4 questions)—3rd
5. Rhetorical synthesis (2-5 questions)—4th
    a. New question type!

MOST COMMON MISTAKES

1. Not reading full text
    - In new SAT, there are only short texts, so every word becomes more significant
    - Most students DO NOT struggle with time management on SAT
2. Not reading full answer choice
    - Even if first 90% is correct, the final 10% could make the choice wrong
3. Missing transitions, negatives/double negatives, and “support” vs “weaken”
    - If these words are not noticed, you will likely miss the question
    - Find correct answer without the negative, then switch the meaning of the word to include the negative
4. Being spooked by long questions and answer choices
    - Usually #9-14
    - Do these longest questions last (ideal order of questions)

MOST COMMON MISTAKES, II

5. Falling for “trap answers”
    - “Trap answers” tend to be partially but not entirely correct
    - Even if first 15 words are correct, the final 3 words can derail an answer choice
    - Be wary of extreme language (“must,” “always,” “none,” “all,” “most”)
6. Making assumptions
    - These answers might be true to you but are not supported by the text
    - Every correct answer is supported by the text and should NEVER be assumed
7. Missing connotation of a text
    - If a text only uses positive language, or uses positive language then switches to negative (e.g., with a “however”), the answer must match the tone/mood

TOP READING STRATEGIES

1. Do vocabulary first, then skip to grammar (~#15)
   - Get quick/easy questions out of the way first
2. Read question before reading text
3. Eliminate wrong answers
   - Extreme answer choices, ones that draw too far of a conclusion, ones that are the opposite meaning
4. Pay attention to transition words and negatives
5. Pay attention to connotation
6. Never leave any question unanswered

SPECIFIC READING QUESTIONS

1. Rhetorical synthesis (today)
2. Grammar
   - Subject-verb agreement (next week)
   - Modifier placement (next week)
   - Punctuation rules (next week)
3. Vocabulary and transitions (next week)
4. Reading comprehension (next week and final session)

RHETORICAL SYNTHESIS

While researching a topic, a student has taken the following notes:

- Pterosaurs were flying reptiles that existed millions of years ago.
- In a 2021 study, Anusuya Chinsamy-Turan analyzed fragments of pterosaur jawbones located in the Sahara Desert.
- She was initially unsure if the bones belonged to juvenile or adult pterosaurs.
- She used advanced microscope techniques to determine that the bones had few growth lines relative to the bones of fully grown pterosaurs.
- She concluded that the bones belonged to juveniles.

The student wants to present the study and its findings. Which choice most effectively uses relevant information from the notes to accomplish this goal?

(A) In 2021, Chinsamy-Turan studied pterosaur jawbones and was initially unsure if the bones belonged to juveniles or adults.

(B) Pterosaur jawbones located in the Sahara Desert were the focus of a 2021 study.

(C) In a 2021 study, Chinsamy-Turan used advanced microscope techniques to analyze the jawbones of pterosaurs, flying reptiles that existed millions of years ago.

(D) In a 2021 study, Chinsamy-Turan determined that pterosaur jawbones located in the Sahara Desert had few growth lines relative to the bones of fully grown pterosaurs and thus belonged to juveniles.

RHETORICAL SYNTHESIS

- 4-8 questions total (7-15% of test)
- Always the last ones on a module
- Question features a series of bullet-point notes taken on a subject
- You are asked to synthesize the information to achieve a rhetorical goal
  - "The student wants to emphasize the aim of the research study."
  - "The student wants to emphasize the study's methodology."
  - "The student wants to emphasize the duration and purpose of the Smith's work."

Problem-Solving Process

1. DO NOT READ THE NOTES
2. Read the first sentence of the question
3. Eliminate answer choices that do not achieve the goal
4. Only reference notes if two choices could answer the question

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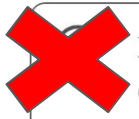

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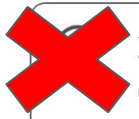

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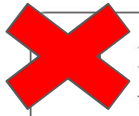

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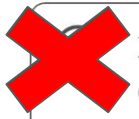

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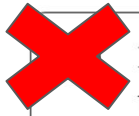

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While researching a topic, a student has taken the following notes:

- As engineered structures, many bird nests are uniquely flexible yet cohesive.
- A research team led by Yashraj Bhosale wanted to better understand the mechanics behind these structural properties.
- Bhosale's team used laboratory models that simulated the arrangement of flexible sticks into nest-like structures.
- The researchers analyzed the points where sticks touched one another.
- When pressure was applied to the model nests, the number of contact points between the sticks increased, making the structures stiffer.

The student wants to present the primary aim of the research study. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A. Bhosale's team wanted to better understand the mechanics behind bird nests' uniquely flexible yet cohesive structural properties.

B. The researchers used laboratory models that simulated the arrangement of flexible sticks and analyzed the points where sticks touched one another.

C. After analyzing the points where sticks touched, the researchers found that the structures became stiffer when pressure was applied.

D. As analyzed by Bhosale's team, bird nests are uniquely flexible yet cohesive engineered structures.

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- Cambodia's Angkor Wat was built in the 1100s to honor the Hindu god Vishnu.
- It has been a Buddhist temple since the sixteenth century.
- Decorrelation stretch analysis is a novel digital imaging technique that enhances the contrast between colors in a photograph.
- Archaeologist Noel Hidalgo Tan applied decorrelation stretch analysis to photographs he had taken of Angkor Wat's plaster walls.
- Tan's analysis revealed hundreds of images unknown to researchers.

The student wants to present Tan's research to an audience unfamiliar with Angkor Wat. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A. Tan photographed Angkor Wat's plaster walls and then applied decorrelation stretch analysis to the photographs.

B. Decorrelation stretch analysis is a novel digital imaging technique that Tan used to enhance the contrast between colors in a photograph.

C. Using a novel digital imaging technique, Tan revealed hundreds of images hidden on the walls of Angkor Wat, a Cambodian temple.

D. Built to honor a Hindu god before becoming a Buddhist temple, Cambodia's Angkor Wat concealed hundreds of images on its plaster walls.

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While researching a topic, a student has taken the following notes:

- The Philadelphia and Lancaster Turnpike was a road built between 1792 and 1794.
- It was the first private turnpike in the United States.
- It connected the cities of Philadelphia and Lancaster in the state of Pennsylvania.
- It was sixty-two miles long.

The student wants to emphasize the distance covered by the Philadelphia and Lancaster Turnpike. Which choice most effectively uses relevant information from the notes to accomplish this goal?

A. The sixty-two-mile-long Philadelphia and Lancaster Turnpike connected the Pennsylvania cities of Philadelphia and Lancaster.

B. The Philadelphia and Lancaster Turnpike was the first private turnpike in the United States.

C. The Philadelphia and Lancaster Turnpike, which connected two Pennsylvania cities, was built between 1792 and 1794.

D. A historic Pennsylvania road, the Philadelphia and Lancaster Turnpike was completed in 1794.

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PART IV

MATH

OVERVIEW

- 2 modules
  - Second module is adaptive
- Each module progresses from easy to difficult
- Calculator can be used on every question
- Desmos on-screen graphing calculator is provided
- ~11 questions are student-produced response
- ~13 questions are word problems

CONTENT BREAKDOWN

Type of Math	Number of Questions
Algebra	13–15
Advanced Math	13–15
Problem-Solving and Data Analysis	5–7
Geometry and Trigonometry	5–7

Source: College Board (https://satsuite.collegeboard.org/sat/whats-on-the-test/math/overview)

DESMOS

- Essentially fully functional
  - https://www.desmos.com/testing/cb-digital-sat/graphing
- Do not need to solve for y as on TI graphing calculators
- Can graph ordered pairs and compute regression lines/curves
- Touchscreens: pinch/spread on an axis to only zoom that axis
- Only graphs variables x and y/f(x) (can use a slider for other letters as constants)
- Personal graphing calculators (e.g., TI-84s) are still allowed throughout test

STUDENT-PRODUCED RESPONSE

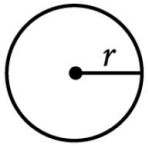
- ~25% of test (~11 questions) are not multiple choice but require that you type in the answer
- These can now have negative answers
- Answers accept up to 5 characters
  - If entering a repeating decimal, you must use all 5 characters
    - ⅔ would round to either .6667 or .6666, not to .667 or .666
- Fractions DO NOT need to be simplified
  - If 15/17 is the answer in the key, 45/51 would also be accepted, for instance

STUDENT-PRODUCED RESPONSE CAN BE NEGATIVE

$$z^2 + 10z - 24 = 0$$

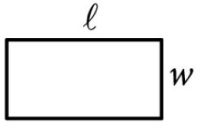
What is one of the solutions to the given equation?

FORMULA REFERENCE GUIDE

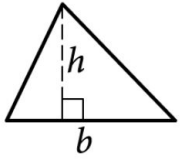


$A = \pi r^2$

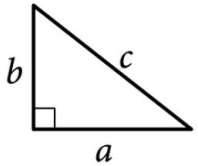
$C = 2\pi r$



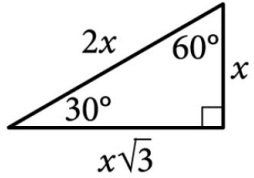
$A = \ell w$

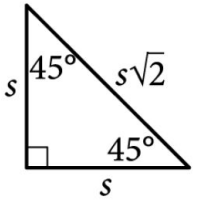


$A = \frac{1}{2}bh$

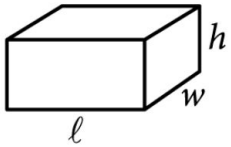


$c^2 = a^2 + b^2$

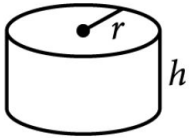




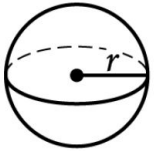
Special Right Triangles



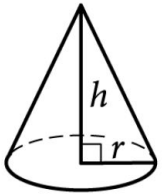
$V = \ell wh$



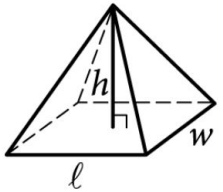
$V = \pi r^2 h$



$V = \frac{4}{3}\pi r^3$



$V = \frac{1}{3}\pi r^2 h$



$V = \frac{1}{3}\ell wh$

The number of degrees of arc in a circle is 360.

The number of radians of arc in a circle is 2π.

The sum of the measures in degrees of the angles of a triangle is 180.

MOST COMMON MISTAKES

1. Losing track of negatives
   - SAT frequently adds negatives to problems in order to increase the difficulty, so show each algebra step on paper
2. Not solving for actual question
   - If SAT asks for the value of x+3, there will be a trap answer that is the value of x
3. Forgetting to use a number given
   - If the SAT gives a number, you are going to use it (>90% certainty)
4. Being spooked by word problems
   - Follow the math problem-solving process given next
5. NOT USING DESMOS!!!
   - This may be the most powerful tool ever given on a standardized test…

SAT MATH TIPS

1. Use Desmos as much as possible
2. Guess on difficult questions, and flag them to return
3. Focus on what you DO know, not what is confusing you
4. If you don't see how to solve the entire problem, take one step you know you can take
5. If a word problem gives you a number, you are almost certainly going to use that number
6. Pay special attention to negatives in problems, as this is the most common source of errors
7. y=mx+b is the most important equation for the test

TOP MATH STRATEGIES

1. Using Desmos (TODAY)
2. Guessing and checking (Next sessions)
3. Plugging numbers in (Next sessions)

USING DESMOS

1. Solving for x
   - Note: if using Desmos to solve for x in an equation with no “y,” Desmos displays the solutions as vertical lines
2. Systems of equations
3. Finding maximum/minimum values
4. Finding factors of a polynomial
5. Finding equivalent expressions
6. Translating graphs
7. Inequalities

Using Desmos

$$\frac{55}{x+6} = x$$

What is the positive solution to the given equation?

Using Desmos

At how many points do the graphs of the equations $y = x + 20$ and $y = 8x$ intersect in the *xy*-plane?

A. 0

B. 1

C. 2

D. 8

Using Desmos

$$6x + 7y = 28$$
$$2x + 2y = 10$$

The solution to the given system of equations is (x, y). What is the value of y?

A. -2

B. 7

C. 14

D. 18

Using Desmos

$$f(x) = 4x^2 - 50x + 126$$

The given equation defines the function f. For what value of x does $f(x)$ reach its minimum?

Using Desmos

$$x(x + 1) - 56 = 4x(x - 7)$$

What is the sum of the solutions to the given equation?

Using Desmos

$$64x^2 + bx + 25 = 0$$

In the given equation, b is a constant. For which of the following values of b will the equation have more than one real solution?

A. -91

B. -80

C. 5

D. 40

Using Desmos

In the xy-plane, a line with equation $2y = c$ for some constant c intersects a parabola at exactly one point. If the parabola has equation $y = -2x^2 + 9x$, what is the value of c?

AGAIN, THANK YOU!