The First Step: SAT Review Guide

Introduction:

The math portion of the SAT test is worth a total of 800 points. The score you get depends on the test date because on certain dates, you may get a perfect score even though you got two or maybe three questions wrong. If you take the online test, the platform provides a graphic and scientific calculator. This calculator can help you save time on tests depending on the questions you get. There are three difficulty levels: easy, medium, and hard. The order you receive these is totally random, but (for example) if you get a hard question wrong, the algorithm provides an easy question so you can have the opportunity to gain more points. This feature is only available in the online version of the test. If you take the physical test, you have to use your own scientific calculator.

- Different types of math problems:
    - Algebra: The algebra questions mainly focus on linear equations, inequalities, and simple grade functions.
    - Advanced Math: The advanced algebra part focuses on quadratic equations, polynomials, and higher-order functions.
    - Geometry and Trigonometry: This part focuses on angles, triangles, circles, and functions.
    - Data Analysis: These questions are mainly statistics based, but it is not specified what theorems are included.

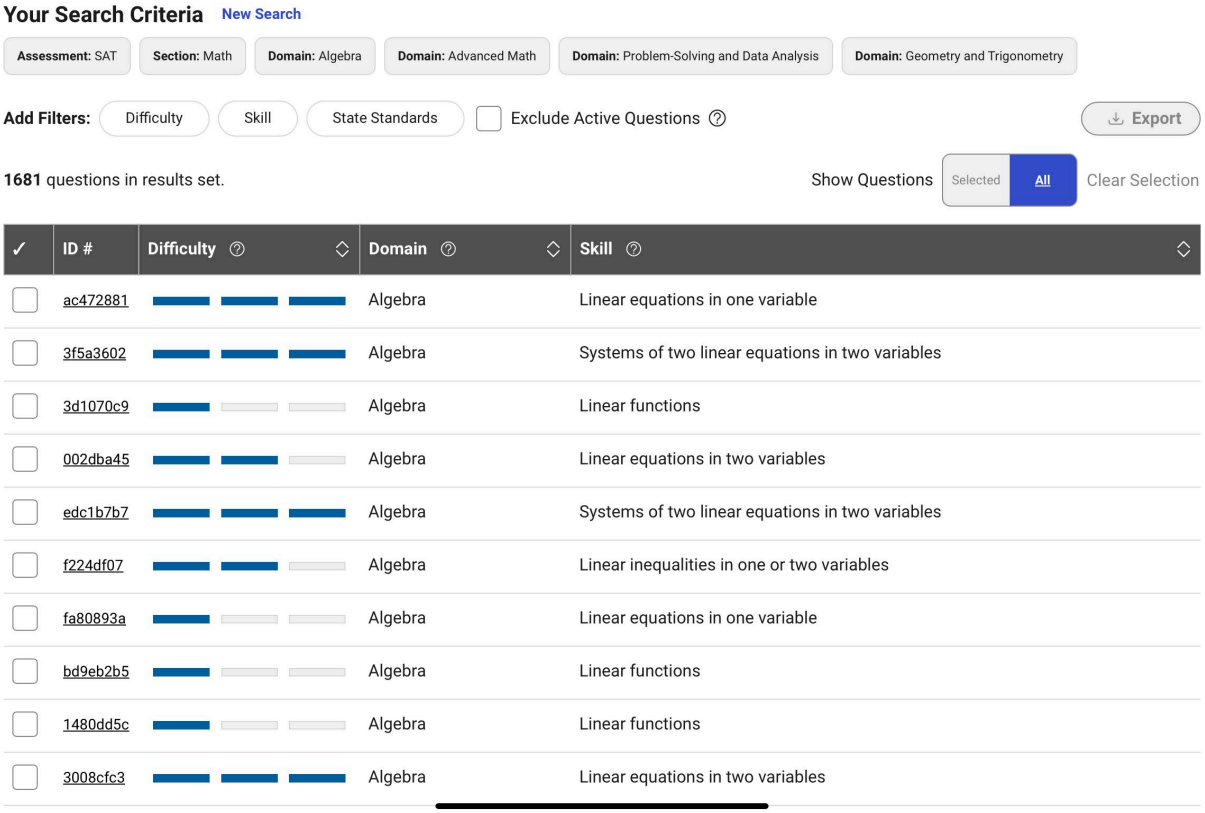
- Difficulty levels:
    - Easy
    - Medium
    - Hard

How can I prepare myself for the SAT at home?

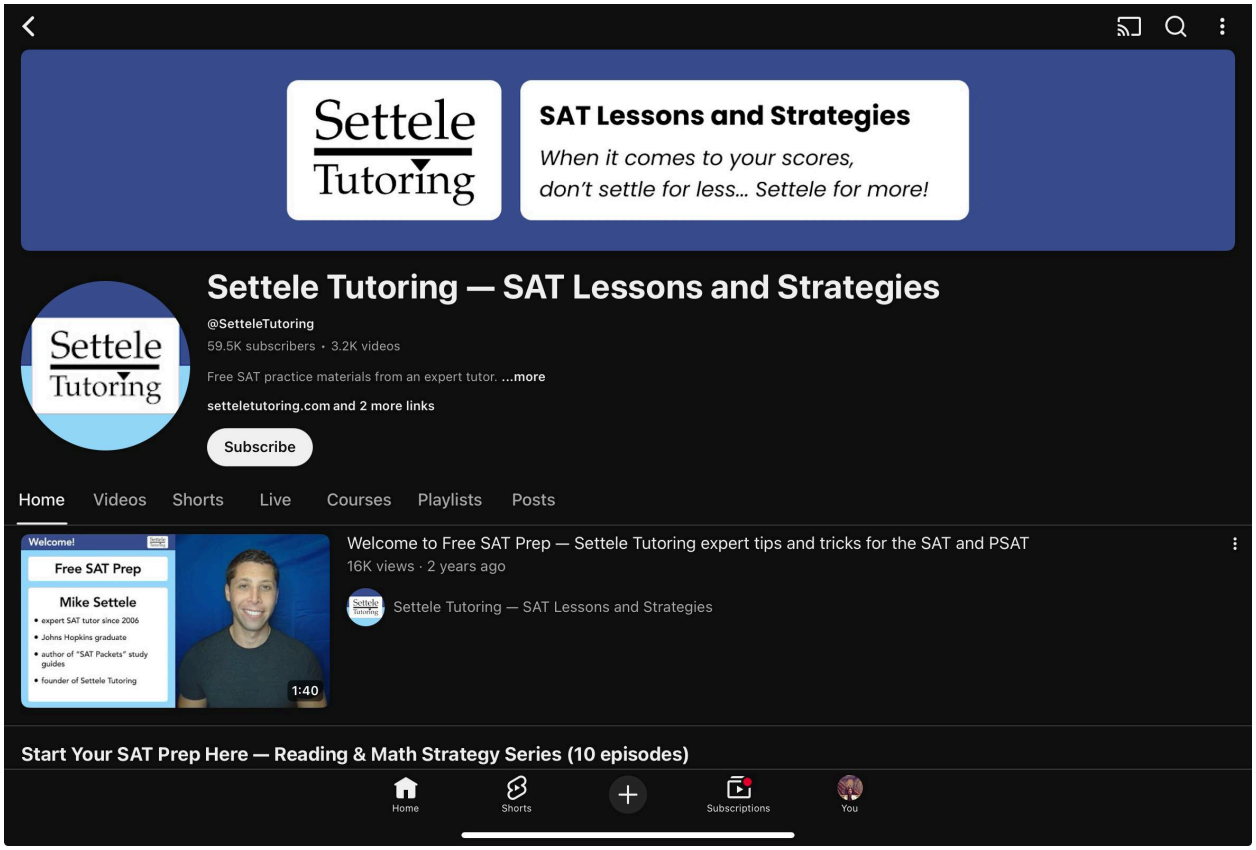
- The College Board online website provides reviews for every test on their site. These reviews are called “Suite Question Banks”. These question banks provide the three different difficulty level questions for both math and reading & writing. You can modify what section you want to practice on and what level you want the questions to be. For example, if you choose math only you can also choose which math domain you want to practice on. Once you choose everything, the list of questions appears before you. On the left, you have a check mark box beside a series number for each question. In the middle section, you can see what difficulty level each question is. On the right side, you see what section it belongs to and what domain each question is. You can access each question by

clicking on the series number besides the check box on the left.When you click on it, you can hide the correct answer by clicking the check box on the bottom of the page. As you answer the questions, you can use the check box at the left to mark the questions you answered correctly.

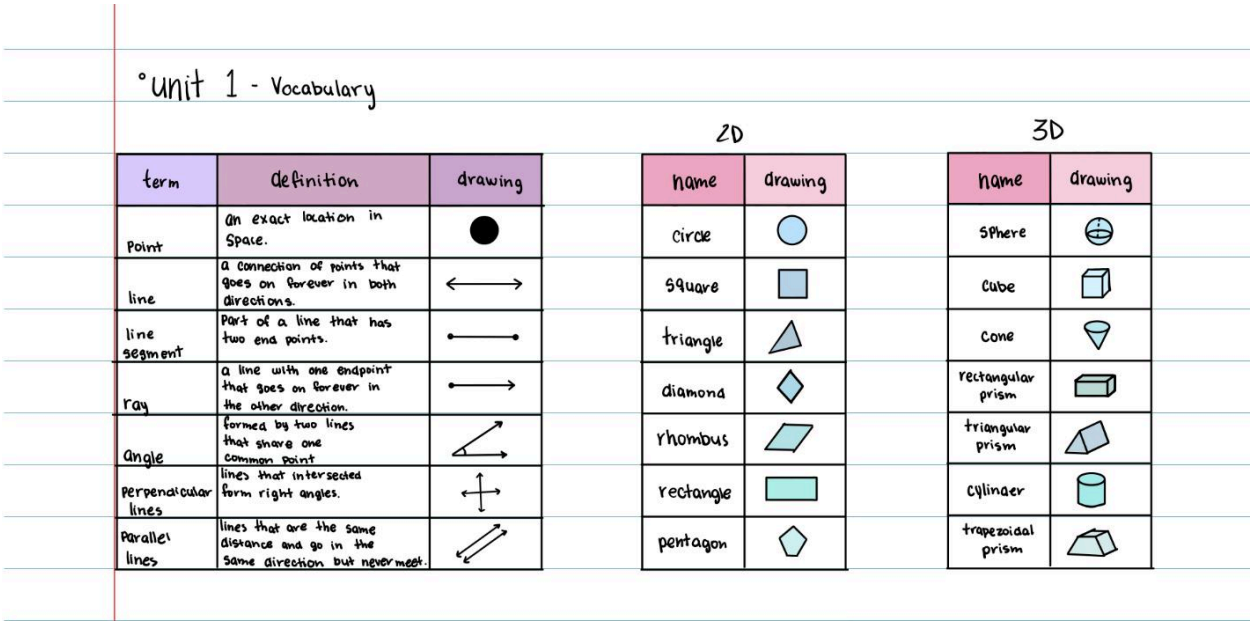
Screen example:



- You can also review by watching tutor sessions on YouTube. The one I personally recommend is Settele-Tutoring. This channel has each section, skill, domain, and difficulty explained in their videos. These videos are divided into playlists you can watch to match your rhythm and difficulty level. Besides the explanations, their channel also provides information about FAQ's, tips for getting a better score, and strategies implemented into the exam. This can be helpful if you (like me) don't know much about the exam and its content.



Part 1: Geometry



° Unit 1 - Vocabulary

term	definition	drawing
Point	an exact location in space.	●
line	a connection of points that goes on forever in both directions.	↔
line segment	part of a line that has two end points.	•—•
ray	a line with one endpoint that goes on forever in the other direction.	•→
angle	formed by two lines that share one common point	∠
perpendicular lines	lines that intersected form right angles.	⊥
Parallel lines	lines that are the same distance and go in the same direction but never meet.	∥

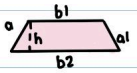
2D

name	drawing
circle	○
square	□
triangle	△
diamond	◇
rhombus	▱
rectangle	▭
pentagon	⬠

3D

name	drawing
sphere	◯
cube	◻
cone	△
rectangular prism	▭
triangular prism	◺
cylinder	⬭
trapezoidal prism	⏢

° Basic formulas

Square	Perimeter = 4a Area = a^2		Circle	Diameter = 2r Circumference = $2\pi r$ Area = πr^2	
Rectangle	Perimeter = 2w + 2l Area = l x w		Trapezoid	Area = 1/2h(b1 + b2) Perimeter = a + b1 + a1 + b2	
Triangle	Perimeter = a + b + c Area = (1/2) x b x h Pythagorean Theorem = $c^2 = a^2 + b^2$		Parallelogram	Area = lh Perimeter = 2l + 2w	

° Review exercises

1. Two angles are complementary. One angle measures $(3x + 12)°$ and the other measures $(2x - 17)$.

a) Find the value of x.

b) Find the measure of each angle.

a) * complementary : add up to 90°

$3x + 12 + 2x - 17 = 90$

$3x + 2x + 12 - 17 = 90$

$5x - 5 = 90$

$+5 \quad +5$

$\frac{5x}{5} = \frac{95}{5}$

$x = 19$

b) substitute x

$3x + 12$	$2x - 17$
$3(19) + 12$	$2(19) - 17$
$57 + 12$	$38 - 17$
$= 69°$	$= 21°$

2. In △ABC,

$\angle A = 4x + 10$
$\angle B = 3x - 5$
$\angle C = x + 15$

a) Find the value of x.
b) Classify the triangle by its angles (acute, right, or obtuse).

a) * a triangles inner angles MUST add up to 180°

$4x + 10 + 3x - 5 + x + 15 = 180°$

$4x + 3x + x + 10 - 5 + 15 = 180°$

$8x + 20 = 180°$

$-20 \quad -20$

$\frac{8x}{8} = \frac{160°}{8}$

$x = 20$

b) substitute

$4x + 10$	$3x - 5$	$x + 15$
$4(20) + 10$	$3(20) - 5$	$20 + 15$
$80 + 10$	$60 - 5$	$= 35°$
$= 90°$	$= 55°$	

° this triangle is a right triangle

3. A circle has a radius of 7 cm.

a) Find the circumference. (Use $\pi \approx 3.14$)
b) Find the area.

a) formula: $2\pi r$

$C = 2\pi r$

$C = 2(3.14)(7)$

$C = (6.28)(7)$

$C = 43.96\ cm$

b) formula: πr^2

$A = \pi r^2$

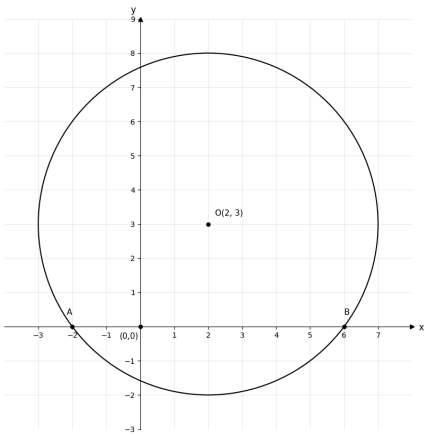
$A = (3.14)(7)^2$

$A = (3.14)(49)$

$A = 153.86\ cm^2$

Practice and example exercises:

1. What is the area of $\triangle ABO$? Refer to the figure below.



A. 10
B. 15
C. 12
D. 24

Length: AB = 8
Length: O to AB = 3

2. Circle O (not shown) is divided into three sectors. Points P, Q, and R are on the circumference of the circle. Sector POR has an area of 8π, and sector ROQ has an area of 6π. If the radius of circle O is 4, what is the measure of the central angle of sector QOP, in degrees?

A. 45

B. 180
C. 200
D. 135

3. If A and B both lie on a circle with an area of 16π, and the length of arc AB is 2π, what is the radian measure of the central angle between A and B?

A. $\pi/2$
B. $\pi/4$
C. $2\pi/3$
D. $\pi/8$

4. The sum of the interior angles of a triangle is 180. If a right triangle has one angle that measures 35, what is the measure of the third triangle?

A. 45
B. 55
C. 65
D. 145

5. A circle has a radius of 5. What is the circumference of the circle in terms of π?

A. 5π
B. 10π
C. 25π
D. 100π

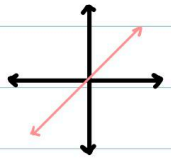
6. A rectangular box has a length of 4, a width of 3, and a height of 2. What is the volume of the box?

A. 9
B. 12
C. 24
D. 26

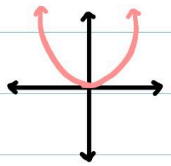
Part 2: Algebra

Algebra functions:

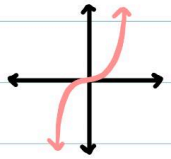
1. lineal: $f(x) = ax + b$



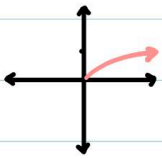
2. quadratic: $ax^2 + bx + c$



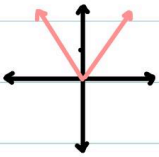
3. cubic: $ax^3 + bx^2 + cx + d$



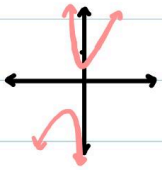
4. square root: $\sqrt{x}$



5. absolute value: $|x|$



6. rational: $\frac{1}{x}$



¿How can I create a math model?

Example 1a: A movie theatre charges $7.00 for a large popcorn, $3.50 per soft drink, and 0.50¢ for any additional butter on popcorn. If the total is $16.50 for 1 tub of popcorn, twice the amount of soft drinks, how many pumps of butter did I add to my popcorn?

model: $2(7) + 0.5x = \$16.50$

explanation: x = # of pumps = cost $0.5(x)$

↳ since drinks are twice the amount of tubs of popcorn = $(2)(3.50) = \$7$

1. If 3x - 5 = 16, what is the value of x +10.

A. 17
B. 7
C. 10
D. 21

2. If f(x) = 2x - 3x +5, what is the value of f(-2)?

A. 3
B. 7
C. 15
D. 19

3. A taxi service charges a flat fee of $4.00 plus $2.50 per mile. Which equation represents the total cost C for a ride of *m* miles?

A. C= 4m + 2.50
B. C = 4+ 2.50m
C. C = 6.50m
D. C = 4 (2.50m)

4. Solve for w in the following inequality: $4w - 7 < 21$.

A. $w < 4$
B. $w < 6.7$
C. $w < 7$
D. $w < 2$

5. A local landscaping company charges a one-time equipment fee of $45 plus an hourly rate of $22.50 per laborer. If a homeowner was charged a total of $247.50 for a project that required 3 laborers working for the same amount of time, how many hours did each laborer work?

A. 3
B. 4
C. 5
D. 9

Part 4: Data analysis

1. A survey asked 200 students if they prefer pizza or tacos. 120 students preferred pizza. If a student is chosen at random, what is the probability that they prefer tacos?

A. 40%
B. 60%
C. 80%
D. 120%

2. A bag contains 3 red marbles, 5 blue marbles, and 2 green marbles. If one marble is drawn at random, what is the probability it is NOT blue?

A. ½
B. 3/10
C. ⅕

D. 7/10

3. A table shows that in a group of 50 people, 20 have blue eyes and 30 have brown eyes. Of those with blue eyes, 5 wear glasses. If a person is chosen at random from the group, what is the probability they have blue eyes AND wear glasses?

A. 1/10
B. ¼
C. ⅖
D. ½