

# SAT “Final Push” – Day 1

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## 1 Today’s Events

- Introductions.
- Reading section 1 practice exam.
- Review of Reading section 1 exam.
- Math section 3 practice exam.
- Lunch.
- Review of Math section 3 practice exam.
- Writing section 2 practice exam.
- Review of Writing section 2 practice exam.
- Math section 4 practice exam.
- Brief math lecture.

### 1.1 New Words from Reading Section

- incantation (n) - a chant.
- ruffle (v) - to wrinkle, make uneven; to annoy, upset; to flip through.
- protracted (adj) - drawn out; lengthy.
- constitute (v) - to make up the parts of; to compose.
- inert (adj) - unable to act or move; inactive; sluggish.
- dabble (v) - work at in a non-serious fashion; splash around.
- disseminate (v) - to scatter or spread widely.
- brusque (adj) - short, abrupt, dismissive.
- sadist (n) - one who enjoys causing pain.
- masochist (n) - one who enjoys his or her own pain and suffering.
- speculate (v) - to look at and think about something from different points of view; to guess.

### 1.2 New Words from Writing Section

- effusive (adj) - emotionally excessive; overly demonstrative.
- efficacy (n) - effectiveness.
- quaint (adj) - attractively unusual or old-fashioned.
- voracious (adj) - desiring or consuming great quantities.
- culinary (adj) - of or related to cooking or the kitchen.

- prosaic (adj) - dull.

## 1.3 Lecture Notes

### 1.3.1 Writing

On the difference between the words affect and effect:

Effect (v) - means to bring about. *My class effected higher scores.*

Effect (n) - a result of an action. *My class had a good effect on your score.*

Affect (v) - to cause an effect. *My class positively affected your score.*

Affect (n) - feelings or emotion. *Affect is the term used for the experiencing of feelings or emotion in psychological study.*

Note that effect as a verb and affect as a noun are used quite rarely, especially for affect. So, you can always assume that affect is a verb, and it's a generally safe assumption that effect is a noun. When in doubt, if you need a noun, pick effect, and if you need a verb, pick affect.

### 1.3.2 Math

Be sure you are completely familiar with the following statistics terms:

**Definition 1.1.** Given a set of data, the *mean* of the data is the average. So, given  $\{x_1, x_2, x_3, \dots, x_n\}$ , the mean of this set of data is

$$\bar{x} = \frac{x_1 + x_2 + x_3 + \dots + x_n}{n}.$$

**Definition 1.2.** Given a set of data, the *median* of the data is the middle point. So, consider a set of data  $\{x_1, x_2, x_3, \dots, x_{2n-1}\}$ , so that there's an odd number of data points. Then, the median is

$$\text{median} = x_n.$$

Now consider a set of data that has an even number of data points,  $\{x_1, x_2, x_3, \dots, x_{2n}\}$ . Then, the median is

$$\text{median} = \frac{x_n + x_{n+1}}{2}.$$

**Definition 1.3.** Given a set of data, the value (or values) that appears most often is called the *mode*.

**Definition 1.4.** Given a set of data, the *range* of the set is the largest element minus the smallest element.

Moving on to more advanced statistics, recall that we discussed what standard deviation is, how to solve for it explicitly, and how to figure out if it is big or small by looking at a set of data.

**Definition 1.5 [Informal].** Given a set of data, its *standard deviation* is, on average, how far away data points are from the mean of the set of data.

What does this definition mean? If the data points are clustered around the mean, then the standard deviation is low. If the data points are far away from the mean, then the standard deviation is high.

Now, let's look at how to explicitly calculate the standard deviation.

**Definition 1.6 [Formal].** The standard procedure for calculating the *standard deviation* of a set of data  $\{x_1, \dots, x_n\}$  goes as follows:

1. Calculate the mean of the data,  $\mu = \frac{x_1 + \dots + x_n}{n}$ .
2. Create a new list of data by calculating the distance squared of every point from the mean. So, the new list of data looks like  $\{(x_1 - \mu)^2, (x_2 - \mu)^2, \dots, (x_n - \mu)^2\}$ . Note that all of these values are positive, since each of the values is the square of a real number.
3. Find the mean of this new list,  $\sigma = \frac{(x_1 - \mu)^2 + \dots + (x_n - \mu)^2}{n}$ . This value is called the *variance* of the original data set  $\{x_1, x_2, \dots, x_n\}$ .
4. Finally, the standard deviation of the data set  $\{x_1, \dots, x_n\}$  is given by the value  $\sqrt{\sigma}$ .

That's a lot of symbols, so let's look at a concrete example.

**Example 1.7.** Find the standard deviation for the data set  $\{2, 4, 9\}$ .

*Proof.* Let's go through each of the steps presented in [Definition 1.6](#).

- i) First, we find the mean of our data set.  $\mu = \frac{2 + 4 + 9}{3} = \frac{15}{3} = 5$ .
- ii) Now, we create a new list of data by finding the square of the distance of each value from the mean. This gives us the list  $\{(2 - 5)^2, (4 - 5)^2, (9 - 5)^2\}$ , or  $\{9, 1, 16\}$ .
- iii) We calculate the mean of this new data set.  $\frac{1 + 9 + 16}{3} \approx 8.67$ .
- iv) Finally, we take the square root of that mean to get our standard deviation,  $\sqrt{8.67} \approx \boxed{2.94}$ . □

If it appears on the calculator section, your calculator should also be able to find the standard deviation of a set of data.

## 2 Homework

### 2.1 Vocabulary

You should know the 17 words in sections 1.1 and 1.2, as well as their parts of speech, their definitions, and how to use them effectively in a sentence.

### 2.2 Latin and Greek Roots

You should know the following Latin or Greek roots, as well as what they mean and at least two words in English that contain said root:

- *ab-, abs-*: From the Latin *ab*, means **away from**. Examples: abnormal, abrasion, absent, abstain, abstract.
- *acr-*: From the Greek *akros* (*ακρος*), means **height, summit, or tip**. Examples: acrobatics, acromegaly, acronym, acrophobia.
- *amph-*: From the Greek *amphi* (*αμφι*), means **both**. Examples: amphibian, amphoterism, amphibolic.

- *an-*, *ana-*: From the Greek *ana* ( $\alpha\nu\alpha$ ), means **against**. Examples: anabaptist, anaphylaxis, anion, anode.
- *ann-*, *-enn-*: From the Latin *annus*, means **year** or **yearly**. Examples: anniversary, annual, biannual, millennium.
- *anti-*, *ante-*: From the Latin **ante**, means **before**. Examples: antebellum, antediluvian, anticipate, antiquarian.