

## Standard Score Problems

**Assuming a population mean of 500 and a population standard deviation of 100 for the verbal subtest of the SAT exam:**

1. What percentage of the student population has SAT-V scores greater than 600?
2. What percentage of the student population has SAT-V scores greater than 700?
3. What percentage of the student population has SAT-V scores lower than 420?
4. What percentage of the student population has SAT-V scores between 300 and 520?
5. What percentage of the student population has SAT-V scores between 250 and 600?
6. What percentage of the student population has SAT-V scores between 500 and 550?
7. A student gets a 620 on this test. Convert this to a percentile.
8. 7. A student gets a 340 on this test. Convert this to a percentile.

## Answers

1. What percentage of the student population has SAT-V scores greater than 600?

$$z = (600-500) / 100 = 100/100 = 1.0$$

$$\text{Percentage} = 15.87$$

2. What percentage of the student population has SAT-V scores greater than 700?

$$z = (700-500) / 100 = 200/100 = 2.0$$

$$\text{Percentage} = 2.28$$

3. What percentage of the student population has SAT-V scores lower than 420?

$$z = (420-500) / 100 = -80/100 = -0.8$$

$$\text{Percentage} = 21.19$$

4. What percentage of the student population has SAT-V scores between 300 and 520?

$$z_1 = (300-500) / 100 = -200/100 = -2.0$$

$$\text{Percentage}_1 = 47.72$$

$$z_2 = (520-500) / 100 = 20/100 = 0.2$$

$$\text{Percentage}_2 = 7.93$$

$$\text{Total} = 47.72+7.93 = 55.65$$

5. What percentage of the student population has SAT-V scores between 250 and 600?

$$z_1 = (250-500) / 100 = -250/100 = -2.5$$

$$\text{Percentage}_1 = 43.32$$

$$z_2 = (600-500) / 100 = 100/100 = 1.0$$

$$\text{Percentage}_2 = 34.13$$

$$\text{Total} = 43.32+34.13 = 77.45$$

6. What percentage of the student population has SAT-V scores between 500 and 550?

$$z = (550-500) / 100 = 50/100 = 0.5$$

$$\text{Percentage} = 19.15$$

7. A student gets a 620 on this test. Convert this to a percentile.

$$z = (620-500) / 120 = 120/100 = 1.20$$

$$\text{Percentage} = 88.48 \quad (38.49+50.00)$$

8. A student gets a 340 on this test. Convert this to a percentile.

$$z = (340-500) / 100 = -160/100 = -1.6$$

$$\text{Percentage} = 5.48$$