

Chapter Standardized Test

TEST-TAKING STRATEGY Do not panic if you run out of time before answering all of the questions. You can still receive a high score on the SAT without answering every question.

1. **MULTIPLE CHOICE** In how many ways can a president and vice president be selected from a club of 20 students?

(A) 20 (B) 39 (C) 40
(D) 380 (E) 400

2. **MULTIPLE CHOICE** In how many ways can 2 co-chairs be selected from a club of 20 students?

(A) 10 (B) 39 (C) 40
(D) 190 (E) 380

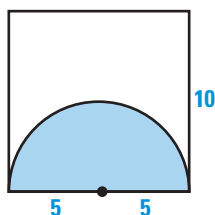
3. **MULTIPLE CHOICE** What is the coefficient of x^5 in the expansion of $(2x + 5)^8$?

(A) 6 (B) 56 (C) 240
(D) 1792 (E) 224,000

4. **MULTIPLE CHOICE** You have an equally likely chance of choosing any number from 1 to 10. What is the probability that you choose a number greater than 6?

(A) $\frac{1}{10}$ (B) $\frac{2}{5}$ (C) $\frac{1}{2}$
(D) $\frac{3}{5}$ (E) $\frac{2}{3}$

5. **MULTIPLE CHOICE** A dart thrown at the square target shown is equally likely to hit anywhere inside the target. What is the probability that the dart hits the shaded semicircle?



(A) $\frac{\pi}{20}$ (B) $\frac{\pi}{10}$ (C) $\frac{\pi}{8}$
(D) $\frac{\pi}{4}$ (E) $\frac{\pi}{2}$

6. **MULTIPLE CHOICE** $P(A) = 0.7$, $P(B) = 0.23$, and $P(A \text{ and } B) = 0.1$. What is $P(A \text{ or } B)$?

(A) 0.13 (B) 0.47 (C) 0.6
(D) 0.83 (E) 0.93

7. **MULTIPLE CHOICE** A mother makes a list of 5 gift ideas for Mother's Day and gives the list to each of her 5 children. If each child buys one gift on the list at random, what is the probability that at least 2 of the gifts are the same?

(A) 25% (B) 50% (C) 75%
(D) 96% (E) 100%

8. **MULTIPLE CHOICE** Events A and B are independent, $P(A) = 0.8$, and $P(B) = 0.7$. What is $P(A \text{ and } B)$?

(A) 1.5 (B) 0.75 (C) 0.56
(D) 0.28 (E) 0.1

9. **MULTIPLE CHOICE** Events A and B are dependent, $P(A) = 50\%$, and $P(B|A) = 50\%$. What is $P(A \text{ and } B)$?

(A) 25% (B) 30% (C) 50%
(D) 75% (E) 100%

10. **MULTIPLE CHOICE** What is the probability that in a family with 5 children exactly 2 are girls? Assume a boy and a girl are equally likely.

(A) $\frac{1}{16}$ (B) $\frac{5}{32}$ (C) $\frac{1}{5}$
(D) $\frac{5}{16}$ (E) $\frac{2}{5}$

11. **MULTIPLE CHOICE** The time that it takes for a fire department to arrive at a particular address on an emergency call is normally distributed with a mean of 6 minutes and a standard deviation of 1 minute. What is the probability that the fire department takes longer than 8 minutes to arrive at a particular address on an emergency call?

(A) 0.015 (B) 0.025 (C) 0.05
(D) 0.235 (E) 0.5

12. **MULTIPLE CHOICE** What is the standard deviation of the normal distribution that approximates a binomial distribution consisting of 119 trials with probability 0.7 of success?

(A) ≈ 0.8 (B) ≈ 5 (C) ≈ 6
(D) ≈ 7 (E) ≈ 11

QUANTITATIVE COMPARISON In Exercises 13 and 14, choose the statement that is true about the given quantities.

- (A) The quantity in column A is greater.
- (B) The quantity in column B is greater.
- (C) The two quantities are equal.
- (D) The relationship cannot be determined from the given information.

	Column A	Column B
13.	The number of ways 4 books can be arranged on a bookshelf	The number of ways 4 books can be chosen from a set of 6 books
14.	${}_{12}C_7$	${}_{12}C_5$

15. **MULTI-STEP PROBLEM** You and a friend are taking part in a fundraiser walk. You both agree to arrive for registration between 8:00 A.M. and 8:30 A.M. You will wait for each other at the registration table for up to 10 minutes.
- a. Let x be the number of minutes after 8:00 A.M. that you arrive, and let y be the number of minutes after 8:00 A.M. that your friend arrives. Let $x = 0$ and $y = 0$ represent 8:00 A.M. Write inequalities representing the time intervals in which you and your friend will arrive.
 - b. If you and your friend are to meet, the difference between your arrival times must not exceed 10 minutes. Write two inequalities that show this fact.
 - c. Graph your inequalities from part (a) showing the times in which you and your friend will arrive. In the same coordinate plane, graph your inequalities from part (b) showing the times you and your friend could meet.
 - d. Using your graph from part (c), find the probability that you and your friend will meet at the registration table.
16. **MULTI-STEP PROBLEM** The *standard normal distribution* has a mean of 0 and a standard deviation of 1. To convert an x -value from a normal distribution with a mean of $\bar{x}$ and a standard deviation of σ to a z -value from a standard normal distribution, use this formula:

$$z = \frac{x - \bar{x}}{\sigma}$$

A z -value gives the number of standard deviations an x -value is from the mean $\bar{x}$. You can use z -values to compare x -values from different normal distributions.

- a. The scores of your class on a test have a mean of 70 and a standard deviation of 8. If your score on the test is x_{old} , what is your corresponding z -value?
- b. Your teacher wants to recenter the scores so that they have a mean of 85 and a standard deviation of 5, but does not want to change the z -value of any score. If your new score is to be x_{new} , what is your corresponding z -value?
- c. Set the formulas for the z -values from parts (a) and (b) equal to each other to get an equation in terms of x_{old} and x_{new} . Solve this equation for x_{new} .
- d. If your score was 70, what is your new score? Does this make sense? Explain.
- e. What percent of your class would originally have had scores between 54 and 78? What will be the new range of scores for this part of the class? How can you answer this question without using the formula from part (c)?