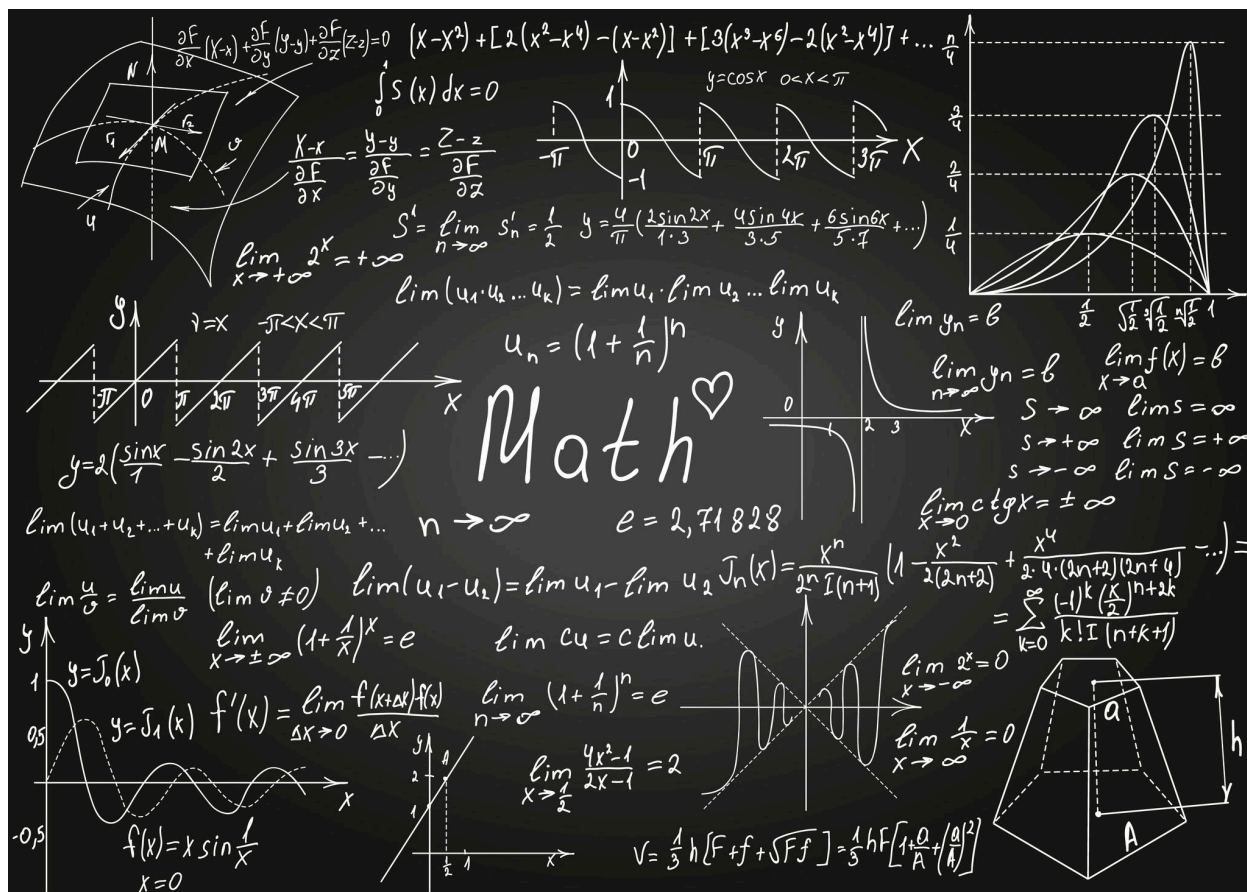


Top 10 Math Formulas to Memorize for the SAT



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Although the Digital SAT provides a reference sheet of formulas, it's crucial to memorize certain key formulas. This blog will highlight the essential formulas you need to know to succeed on the test.

1. Slope Intercept Form

When finding the linear equation of a line or the line of best fit in a scatterplot, use:

$$y = mx + b$$

where m represents the slope and b represents the y-intercept.

2. Finding Slope between Two Points

When given two coordinate points (x_1, y_1) and (x_2, y_2) , you can find the slope using the slope formula:

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

3. Circle Equation

$$(x - h)^2 + (y - k)^2 = r^2$$

where (h, k) represents the center of the circle and r represents the radius of the circle.

4. Exponential Equation Format
Growth

$$f(t) = a(1 + r)^{\frac{t}{b}}$$

where a represents the initial amount, r is the rate of growth, t is the time, and b is how often the rate of growth occurs.

Decay

$$f(t) = a(1 - r)^{\frac{t}{b}}$$

where a represents the initial amount, r is the rate of decay, t is the time, and b is how often the rate of decay occurs.

5. Standard Form of Quadratics

$$y = ax^2 + bx + c$$

To find the x coordinate of the vertex or maximum or minimum, then use $x = -\frac{b}{2a}$.

6. Vertex Form of Quadratics

$$y = a(x - h)^2 + k$$

where (h, k) represents the vertex or minimum or maximum of the parabola.

7. Trigonometry
Soh Cah Toa

$$\sin \sin X = \frac{\textit{opposite}}{\textit{hypotenuse}}, \cos \cos X = \frac{\textit{adjacent}}{\textit{hypotenuse}}, \tan \tan X = \frac{\textit{opposite}}{\textit{adjacent}}$$

8. Discriminant

The discriminant is used to identify the number of distinct real solutions from a quadratic in standard form.

If $b^2 - 4ac < 0$, then there are no real solutions.

If $b^2 - 4ac > 0$, then there are two distinct real solutions.

If $b^2 - 4ac = 0$, then there is one distinct real solution.

9. Arc Length

$$\frac{x}{360} * \textit{Circumference}$$
$$\frac{x}{360} * 2\pi r$$

where x is the central angle of your arc in degrees and r is the radius.

$$\frac{x}{2\pi} * \text{Circumference}$$
$$\frac{x}{2\pi} * 2\pi r$$

where x is the central angle of your arc in radians and r is the radius.

10. Area of a Sector

$$\frac{x}{360} * \text{Area of a Circle}$$
$$\frac{x}{360} * \pi r^2$$

where x is the central angle of your arc in degrees and r is the radius.

$$\frac{x}{2\pi} * \text{Area of a Circle}$$
$$\frac{x}{2\pi} * \pi r^2$$

where x is the central angle of your arc in radians and r is the radius.

Digital SAT Style Questions Using the above formulas:

- Line p in the xy -plane has a slope of $-\frac{2}{3}$ and passes through the point $(6, 5)$. Which equation defines the line p ?
 - $y = -\frac{2}{3}x + 1$
 - $y = -\frac{2}{3}x + 6$
 - $y = -\frac{2}{3}x + 9$
 - $y = -\frac{2}{3}x + 5$
- Line l passes through the points $(7, 2)$ and $(11, 7)$. What is the slope of line l ?
- A circle in the xy -plane has its center at $(-1, 3)$ and its radius 4. Which of the following is an equation of the circle?
 - $(x - 1)^2 + (y + 3)^2 = 4$
 - $(x + 1)^2 + (y - 3)^2 = 4$
 - $(x + 1)^2 + (y - 3)^2 = 16$
 - $(x - 1)^2 + (y + 3)^2 = 16$

4. The function $f(t) = 3500(1.4)^{\frac{t}{210}}$ gives the number of bacteria in a population t minutes after an initial observation. How much time, in minutes does it take for the number of bacteria in the population to increase by 40%?
5. The given equation represents a parabola in the xy -plane. What is the x -coordinate of the vertex?

$$y = x^2 + 6x - 16$$

6. The given equation represents a parabola in the xy -plane. Which of the following equivalent forms of the equation displays the coordinates of the vertex of the parabola as constants or coefficients?

$$y = (x + 3)(x - 5)$$

- A) $y = x^2 - 2x - 15$
 B) $y = (x - 1)^2 - 16$
 C) $y + 16 = x^2 - 2x + 1$
 D) $y + 16 = (x - 1)^2$

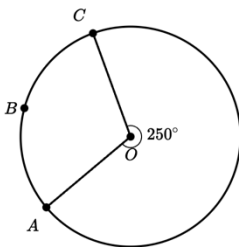
7. In right triangle ABC , $\sin A = \frac{5}{8}$ and the length of AB is 10. What is the length of BC ?

- A) 16
 B) 8
 C) 5
 D) 10

8. How many distinct real solutions does the given equation have?

$$2x^2 - 3x + 7$$

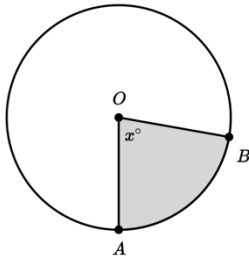
9.



The circle has center O , and a radius of 6. What is the length of minor arc ABC ?

- A) $\frac{11}{3}\pi$
 B) $\frac{6}{11}\pi$
 C) $\frac{11}{36}\pi$
 D) $\frac{11}{25}\pi$

10.



The circle has center O , the length of minor arc AB is 14π , and $x = 60$. What is the area of the shaded region?

- A) 14π
- B) 42π
- C) 294π
- D) 588π

Answers: 1) C 2) $\frac{5}{4}$ 3) C 4) 210 5) -3 6) B 7) A 8) 0 9) A 10) C

At [The Tutoring Institute](#), our tutors believe in making math fun and accessible. Their approach involves interactive activities, games, and hands-on learning experiences that are tailored to the developmental stages of students. They emphasize understanding over memorization, ensuring that students grasp the 'why' behind the 'how'.

Author: Amanda has been a dedicated math tutor for over seven years, specializing in SAT and ACT preparation. She is passionate about assisting adult learners, international students, and students with learning differences. Amanda holds a B.A. in Mathematics with a minor in Economics from Seattle University and is currently a tutor at The Tutoring Institute.