

Directions

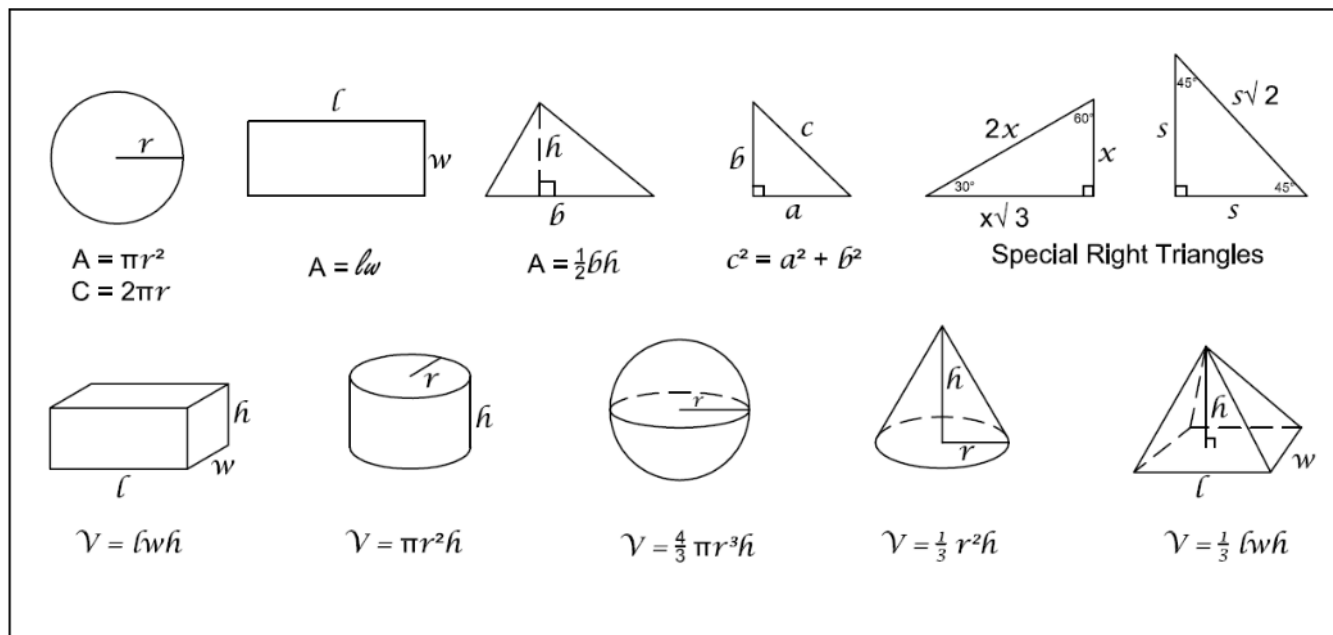
For questions 1-15, solve each problem, choose the best answer from the choices provided, and fill in the corresponding circle on your answer sheet.

For questions 16-20, solve the problem and enter your answer in the grid on the answer sheet. Please refer to the directions before question 16 on how to enter your answers in the grid. You may use any available space in your test booklet for scratch work.

Notes

1. The use of a calculator is **not permitted**.
2. All variables and expressions used represent real numbers unless otherwise indicated.
3. Figures provided in this test are drawn to scale unless otherwise indicated.
4. All figures lie in a plane unless otherwise indicated.
5. Unless otherwise indicated, the domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

Reference



The number of degrees of arc in a circle is 360.

The number of radians of arc in a circle is 2π .

The sum of the measures in degrees of the angles of a triangle is 180.

SAT Test 2-3

Math Test- No Calculator | 25 Minutes, 20 Questions



1. Which of the following expressions is equal to 0 for some value of x ?

- A) $|x - 3| - 3$
- B) $|x + 1| + 3$
- C) $|x + 3| + 3$
- D) $|1 - x| + 3$

2. In the function $f(x) = \frac{7}{2}x + b$, b is a constant.

If $f(8) = 44$, what is the value of $f(-2)$?

- A) 9
- B) 2
- C) -2
- D) 5

3. $\frac{x}{y} = 4$
 $3(y + 4) - 4 = x$

If (x, y) is the solution of the system of equations above, what is the value of y ?

- A) 6
- B) 8
- C) 3
- D) 2

4. If $f(x) = -\frac{2}{3}x + 6$, what is $f(-4x)$ equal to?

- A) $\frac{8x}{3} + 6$
- B) $-\frac{8x}{3} + 6$
- C) $-8x + 6$
- D) $-\frac{4x}{3} + 6$

5. Which of the following is equivalent to the expression

$$\frac{3}{2}(2x + 6)(5x + 2)?$$

- A) $15x^2 + 51x + 18$
- B) $15x^2 + 18$
- C) $30x^2 + 36$
- D) $30x^2 + 114x + 36$

6. If $\frac{x-y}{y} = \frac{5}{7}$, which of the following must also be true?

- A) $\frac{x}{y} = -\frac{2}{7}$
- B) $\frac{x}{y} = \frac{12}{7}$
- C) $\frac{x+y}{y} = \frac{12}{7}$
- D) $\frac{x+2y}{y} = -\frac{2}{7}$

7. To write a novel, Mary made a writing schedule to follow for how long she writes each day. Every week she wants to increase the time she spends writing by a constant amount. According to the schedule, by week 3 she will spend 50 minutes writing. By week 16, she will spend 5 hours and 10 minutes. Which best describes the schedule Mary will follow?

- A) Each week she increased her writing time by 30 minutes.
- B) Each week she increased her writing time by 20 minutes.
- C) Every 2 weeks she increased her writing time by 45 minutes.
- D) Every 2 weeks she increased her writing time by 1 hour.

8. Which of the following equations represents a line that is perpendicular to $y = -6x + 4$?

- A) $y - \frac{1}{6}x = -8$
- B) $3y - 18x = 12$
- C) $y + \frac{1}{6}x = -8$
- D) $\frac{8y-12x}{6} = 2$

9. $\sqrt{x-5} = x-5$

If $a = 4$, what is the solution set of the equation above?

- A) $\{5, 6\}$
- B) $\{5\}$
- C) $\{6\}$
- D) $\{-5\}$

10. If $\frac{a+4}{a-4} = 4$, what is the value of a ?

- A) $\frac{20}{3}$
- B) $\frac{24}{9}$
- C) 4
- D) $\frac{36}{4}$

SAT Test 2-3

Math Test- No Calculator | 25 Minutes, 20 Questions



11. $x = 3y + 7$
 $y = (3x + 2)(x + 5)$

How many ordered pairs (x,y) satisfy the system of equations show above?

- A) 0
- B) 1
- C) 2
- D) Infinite number of pairs

12. Kelly and Anne were shopping at the mall and agree to split the cost of everything evenly. Kelly bought a shirt for x dollars, and Anne bought a dress that is \$4 more expensive than Kelly's shirt. If the sales tax on both items bought together is 15%, which of the following expressions represents the amount in dollars each of them paid?

- A) $1.15x + 2.3$
- B) $0.2x + 0.2$
- C) $2.3x + 4.6$
- D) $1.2x + 0.6$

13. The functions f and g , defined by $f(x) = 18x^2 - 2$ and $g(x) = -18x^2 + 2$, are graphed in the xy -plane. The graphs of f and g intersect at points $(K,0)$ and $(-K,0)$. What is the value of K ?

- A) $\frac{1}{3}$
- B) $\frac{1}{2}$
- C) 1
- D) 3

14. $\frac{5-3i}{2-2i}$

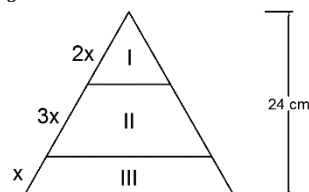
If the expression above is written in the form $a + bi$, where a and b are real numbers, what is the value of a ?

(Note: $i = \sqrt{-1}$)

- A) 2
- B) $\frac{5}{2}$
- C) 4
- D) $\frac{7}{2}$

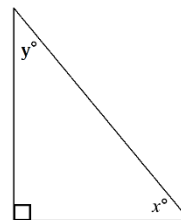
15. In the quadratic equation $2x^2 - \frac{k}{2}x = 8p$, k and p are constants. What are the solutions for x ?

- A) $\frac{k}{8} \pm \frac{\sqrt{k^2 + 256p}}{8}$
- B) $\frac{k}{2} \pm \frac{\sqrt{k^2 + 256p}}{4}$
- C) $\frac{k}{8} \pm \frac{\sqrt{k^2 - 64p}}{8}$
- D) $\frac{k}{2} \pm \frac{\sqrt{k^2 + 64p}}{8}$



16. Mike draws the above triangle on a piece of paper, cut into 3 sections by 2 parallel lines which are also parallel to the base. If the height of this triangle is 24 cm, what is the height of section II?

17. In the triangle below, the sine of x° is 0.8. What is the cosine of y° ?



18. $x^3 - 6x^2 + 8x - 42 = 0$

For what real value of x is the equation above true?

SAT Test 2-3

Math Test- No Calculator | 25 Minutes, 20 Questions



19. $3x + y = 13$
 $x + 6y = -7$

If (x, y) is the solution to the system of equations above, what is the value of x ?

20. Jacob owns his own music store. In his store, he sells guitars. By selling 40 guitars, he receives a profit of \$250, and by selling 20 guitars, he receives a profit of \$100. For every additional 10 guitars sold after the initial 10, the amount of profit Jacob receives increases by k dollars, where k is a constant. What is the value of k ?