

SAT Math Level 2 Subject Test Practice Paper 1

1. A linear function, f , has a slope of -2 . $f(1) = 2$ and $f(2) = q$. Find q .

- A. 0
- B. $\frac{3}{2}$
- C. $\frac{5}{2}$
- D. 3
- E. 4

2. A function is said to be even if $f(x) = f(-x)$. Which of the following is *not* an even function?

- A. $y = |x|$
- B. $y = \sec x$
- C. $y = \log x^2$
- D. $y = x^2 + \sin x$
- E. $y = 3x^4 - 2x^2 + 17$

3. What is the radius of a sphere, with center at the origin, that passes through point $(2,3,4)$?

- A. 3
- B. 3.31
- C. 3.32
- D. 5.38
- E. 5.39

4. If a point (x,y) is in the second quadrant, which of the following must be true?

I. $x < y$

II. $x + y > 0$

III. $\frac{x}{y} < 0$

- A. only I
- B. only II
- C. only III
- D. only I and II
- E. only I and III

5. If $f(x) = x^2 - ax$, then $f(a) =$

- A. a
- B. $a^2 - a$
- C. 0

- D. 1
- E. $a - 1$

6. The average of your first three test grades is 78. What grade must you get on your fourth and final test to make your average 80?

- A. 80
- B. 82
- C. 84
- D. 86
- E. 88

7. $\log_7 9 =$

- A. 0.89
- B. 0.95
- C. 1.13
- D. 1.21
- E. 7.61

8. If $\log_2 m = x$ and $\log_2 n = y$, then $mn =$

- A. 2^{x+y}
- B. 2^{xy}
- C. 4^{xy}
- D. 4^{x+y}
- E. cannot be determined

9. How many integers are there in the solution set of $|x - 2| \leq 5$?

- A. 0
- B. 7
- C. 9
- D. 11
- E. an infinite number

10. If $f(x) = \sqrt{x^2}$, then $f(x)$ can also be expressed as

- A. x
- B. $-x$
- C. $\pm x$
- D. $|x|$
- E. $f(x)$ cannot be determined because x is unknown.

11. The graph of $(x^2 - 1)y = x^2 - 4$ has

- A. one horizontal and one vertical asymptote
- B. two vertical but no horizontal asymptotes
- C. one horizontal and two vertical asymptotes
- D. two horizontal and two vertical asymptotes
- E. neither a horizontal nor a vertical asymptote

12. $\lim_{x \rightarrow \infty} \left(\frac{3x^2 + 4x - 5}{6x^2 + 3x + 1} \right) =$

- A. -5
- B. $\frac{1}{5}$
- C. $\frac{1}{2}$
- D. 1
- E. This expression is undefined.

13. A linear function has an x-intercept of $\sqrt{3}$ and a y-intercept of $\sqrt{5}$. The graph of the function has a slope of

- A. -1.29
- B. -0.77
- C. 0.77
- D. 1.29
- E. 2.24

14. If $f(x) = 2x - 1$, find the value of x that makes $f(f(x)) = 9$.

- A. 2
- B. 3
- C. 4
- D. 5
- E. 6

15. The plane $2x + 3y - 4z = 5$ intersects the x-axis at $(a,0,0)$, the y-axis at $(0,b,0)$, and the z-axis at $(0,0,c)$. The value of $a + b + c$ is

- A. 1
- B. $\frac{35}{12}$
- C. 5
- D. $\frac{65}{12}$
- E. 9

16. Given the set of data 1, 1, 2, 2, 2, 3, 3, 4, which one of the following statements is true?

- A. mean \leq median \leq mode
- B. median \leq mean \leq mode
- C. median \leq mode \leq mean
- D. mode \leq mean \leq median
- E. The relationship cannot be determined because the median cannot be calculated.

17. If $\frac{x-3y}{x} = 7$, what is the value of $\frac{x}{y}$?

- A. $-\frac{8}{3}$
- B. -2
- C. $-\frac{1}{2}$
- D. $\frac{3}{8}$
- E. 2

18. Find all values of x that make $\begin{pmatrix} 2 & -1 & 4 \\ 3 & 0 & 5 \\ 4 & 1 & 6 \end{pmatrix} = \begin{pmatrix} x & 4 \\ 5 & x \end{pmatrix}$.

- A. 0
- B. ± 1.43
- C. ± 3
- D. ± 4.47
- E. 5.34

19. Suppose $f(x) = \frac{1}{2}x^2 - 8$ for $-4 \leq x \leq 4$, then the maximum value of the graph of $|f(x)|$ is

- A. -8
- B. 0
- C. 2
- D. 4
- E. 8

20. If $\tan \theta = \frac{2}{3}$, then $\sin \theta =$

- A. ± 0.55
- B. ± 0.4
- C. 0.55
- D. 0.83
- E. 0.89

21. If a and b are the domain of a function and $f(b) < f(a)$, which of the following must be true?

- A. $a < b$
- B. $b < a$
- C. $a = b$
- D. $a \neq b$
- E. $a = 0$ or $b = 0$

22. Which of the following is perpendicular to the line $y = -3x + 7$?

- A. $y = \frac{1}{-3x+7}$
- B. $y = 7x - 3$
- C. $y = \frac{1}{3}x + 5$
- D. $y = -\frac{1}{3}x + 7$
- E. $y = 3x - 7$

23. The statistics below provide a summary of IQ scores of 100 children.

Mean: 100

Median: 102

Standard Deviation: 10

First Quartile: 84

Third Quartile: 110

About 50 of the children in this sample have IQ scores that are

- A. less than 84
- B. less than 110
- C. between 84 and 110
- D. between 64 and 130
- E. more than 100

24. If $f(x) = \frac{1}{\sec x}$, then

- A. $f(x) = f(-x)$
- B. $f\left(\frac{1}{x}\right) = -f(x)$
- C. $f(-x) = -f(x)$
- D. $f(x) = f\left(\frac{1}{x}\right)$
- E. $f(x) = \frac{1}{f(x)}$

25. The polar coordinates of a point P are $(2, 240^\circ)$. The Cartesian (rectangular) coordinates of P are

- A. $(-1, -\sqrt{3})$
- B. $(-1, \sqrt{3})$
- C. $(-\sqrt{3}, -1)$
- D. $(-\sqrt{3}, 1)$
- E. $(1, -\sqrt{3})$