For all questions, answer choice "E) NOTA" means none of the above answers is correct.

1. Solve for x: $21 \le 3x + 11$

A) $x \ge 10/3$ B) $x \le 10/3$ C) $x \ge -10/3$ D) $x \le -10/3$ E) NOTA

2. Find the value of A/B if A and B are real numbers satisfying $4A + 6Bi = (3+2i)(1-3i)$.

A) $9/4$ B) $-7/6$ C) $-27/14$ D) $-9/7$ E) NOTA

3. Solve for x: $\begin{vmatrix} 1 & 3 & 2 \\ 4 & x & 6 \\ 5 & 2 & 1 \end{vmatrix} = 0$

A) 12 B) $82/9$ C) $64/9$ D) 16 E) NOTA

4. Solve for x: $2\big(2(x+3) - (x+1)\cdot 3\big) = 18$

A) 4 B) -6 C) 6 D) 8 E) NOTA

5. A triangle has side lengths A, B, and C. If $A = 8$ and $B = 11$, then C must satisfy which inequality?

A) $3 < C < 19$ B) $4 \le C \le 18$ C) $6 < C < 12$ D) $8 < C < 16$ E) NOTA

6. Find the sum of the solutions to the equation $x^3 = 27$.

A) 0 B) 3 C) 9 D) -3 E) NOTA

7. The roots of the polynomial $f(x) = x^4 - 2x^3 - 53x^2 + 54x + 504$ are a_1, a_2, a_3, and a_4. Find the value of $a_1a_2 + a_1a_3 + a_1a_4 + a_2a_3 + a_2a_4 + a_3a_4$.

A) 54 B) -54 C) 53 D) -53 E) NOTA

8. Solve for x: $4^{3x+4} = 32^{x-1}$

A) 0 B) 9 C) 17 D) -13 E) NOTA

9. How many integer solutions does the inequality $|6x-4| \le 14$ have?

A) 4 B) 5 C) 8 D) 10 E) NOTA

10. Find the area of the region defined by the inequality $\frac{481}{144} - \frac{10}{9}x + \frac{1}{9}x^2 - \frac{3}{8}y + \frac{1}{16}y^2 \le 1$.

A) 9π B) 12π C) 16π D) 18π E) NOTA

11. If $f(3-x) = \frac{x^2-6x}{x+2}$, which of the following is equivalent to $f(x+1)$?

A) $\frac{x^2+2x-8}{-x+6}$ B) $\frac{x^2-6x}{x+6}$ C) $\frac{x^2+2x-8}{-x+2}$ D) $\frac{x^2+2x}{-x+5}$ E) NOTA

12. If $f(x) = 2^x + 11$, find the domain of $f^{-1}(x)$.

A) $x \ge 11$ B) $x > 11$ C) $x > 2$ D) all real numbers E) NOTA

13. Evaluate: $\sqrt{90+\sqrt{90+\sqrt{90+\ldots}}}$

A) $\frac{1+\sqrt{129}}{2}$ B) $13/2$ C) 10 D) -9 E) NOTA

14. If $f(x) = 6x + \frac{11}{x} - 3$ and $g(x) = x^2$, find the value of $g(f(2))$.

A) $841/2$ B) $841/4$ C) $2/211$ D) $871/8$ E) NOTA

15. Given the equation $\frac{\sqrt{24-8\sqrt{5}}}{\sqrt{6+2\sqrt{5}}} = a + b\sqrt{c}$, where a, b, and c are integers such that c is not divisible by the square of any prime number, find the value of the product abc.

A) -15 B) -30 C) 15 D) 30 E) NOTA

16. Solve for x: $x^2 + 5x - 8 \ge 2x^2 + 2$

A) $x > 6$ B) $x > 1$ C) $x > -5$ D) $x > -2$ E) NOTA

17. Find the zeros of the function $f(z)=15z^2+16z+4$.

A) $-\frac{1}{3}, -\frac{9}{5}$ B) $-5, -\frac{1}{3}$ C) $-2, -1$ D) $-\frac{2}{3}, -\frac{2}{5}$ E) NOTA

18. Find the value of $A+B+C$, where A, B, and C are real numbers such that $\frac{21x^2+166x+321}{(x+3)(x+4)(x+5)}=\frac{A}{x+3}+\frac{B}{x+4}+\frac{C}{x+5}$.

A) 19 B) 23 C) 21 D) 25 E) NOTA

19. Find the value of x in the solution to the system $\begin{cases} 2x+y=16 \\ y+6z=5 \\ x+3z=4 \end{cases}$.

A) -6 B) 2 C) 4.75 D) 6 E) NOTA

20. Solve for x: $(x+3)(x-4)>(x-6)(x+2)$

A) $x>0$ B) $x<0$ C) $x>4$ D) $x<4$ E) NOTA

21. Find the area of the region defined by the inequality $2|x|+3|y|\le 1$.

A) 6 B) $\frac{1}{3}$ C) $\frac{4}{3}$ D) $\frac{2}{3}$ E) NOTA

22. Given that $x+2y=1$, $y+2z=2$, and $z+2x=6$, find the value of $x+y+z$.

A) 1 B) 12 C) 9 D) 3 E) NOTA

23. If A and B are the solutions to the equation $2=8+\frac{5}{x}+\frac{1}{x^2}$, find the value of $\frac{1}{A}+\frac{1}{B}$.

A) -5 B) 5 C) $\frac{5}{6}$ D) $-\frac{5}{6}$ E) NOTA

24. What is the largest coefficient in the expansion of $(3x+5y)^4$?

A) 625 B) 1350 C) 1500 D) 1800 E) NOTA

25. Given the system of equations $\begin{cases} 2x+y+2z=4 \\ x+2y+3z=-1 \\ 3x+2y+z=9 \end{cases}$, find the value of $x+y+z$.

A) -1 B) 3.5 C) 2 D) 1 E) NOTA

26. Find the sum of the coefficients in the expansion of $(x+1)^7$.

A) 94 B) 117 C) 128 D) 256 E) NOTA

27. Find the sum of the real solutions to the equation $(x^2-x-1)^{x^2-x-6}=1$.

A) 5 B) 1 C) 2 D) 3 E) NOTA

28. Given that $1/2$ and $-1/2$ are two of the solutions to the equation $2x^3+Ax^2+Bx-\frac{3}{2}=0$, where A and B are real numbers, find the value of $A+B$.

A) 6 B) $11/2$ C) $13/2$ D) 0 E) NOTA

29. Given the function $f(x)=\begin{cases} 2x, \text{ if } 0\le x<5 \\ -x, \text{ if } 5\le x<10 \\ x^2, \text{ if } x<0 \\ 1, \text{ if } x\ge 10 \end{cases}$, find the value of $f\Big(f\Big(f\Big(f\big(f(2)\big)\Big)\Big)\Big)$.

A) 8 B) 1 C) 2 D) -8 E) NOTA

30. Find the sum of the real solutions to the equation $\big|4x-\big|3x+2\big|\big|=6$.

A) $48/7$ B) $24/7$ C) $20/7$ D) $52/7$ E) NOTA