For all questions, answer choice (E) NOTA means that none of the given answers is correct. Good Luck!

1. Suhas loves counting trees. On day 1 he counts 1 tree, on day 2 he counts 8 trees, and on day 3 he counts 27 trees. If this pattern continues, what is the total number of trees Suhas will count after one week?

   (A) 60 (B) 216 (C) 343 (D) 784 (E) NOTA

2. What is the sum of the exponents in the prime factorization of 3675?

   (A) 3 (B) 4 (C) 5 (D) 6 (E) NOTA

3. Solve the following system of equations to find the product of a, b, and c:

$$5a - b + c = 40$$
$$4a - 5b - 5c = 34$$
$$-4a - 2b - 4c = -28$$

   (A) -144 (B) 144 (C) 196 (D) 16 (E) NOTA

4. How many terms of the set $[\pi, -4, 12.22, e, \sqrt{2}, i]$ are irrational numbers?

   (A) 1 (B) 2 (C) 3 (D) 4 (E) NOTA

5. Sukeerth and Tanmay are super hungry so they decide to get some pizza. If Sukeerth can eat all the pizza in 6 hours, and Tanmay can eat all the pizza in 4 hours, then how long will it take, in minutes, for them to eat all the pizza if they work together?

   (A) 120 (B) 144 (C) 300 (D) 180 (E) NOTA

6. What is the 8th term of the following sequence: 20, 24, 29, 35, 42, 50... ?

   (A) 59 (B) 70 (C) 69 (D) 80 (E) NOTA

   Questions 7-9 use the following functions:

$$f(x) = 3x + 5$$
$$g(x) = 7x + 3$$

7. For what value of x do both functions produce equivalent outputs?

   (A) 2 (B) 3/4 (C) 4 (D) 1 (E) NOTA

8. Find the value of the following expression: $f(g(f(g(f(4)))))$

   (A) 5292 (B) 7805 (C) 6480 (D) 7800 (E) NOTA

9. What is the discriminant of the product of $f(x)$ and $g(x)$?

   (A) $\frac{338}{21}$ (B) 626 (C) 323 (D) $\frac{419}{7}$ (E) NOTA

10. Daniel and Shravan are racing from the point (1, 10) to the point (1, 2). They both make stops at their homes, located at (-3, 6) and (5, 6), respectively, before arriving at the finish line. What was the total amount of distance traveled by both Daniel and Shravan during the race?

    (A) $4\sqrt{2}$ (B) $16\sqrt{2}$ (C) 16 (D) $12\sqrt{3}$ (E) NOTA

11. What is the area of the shape created by the four points mentioned in the previous question?
(A) $32\sqrt{2}$ (B) 24 (C) $40\sqrt{3}$ (D) 32 (E) NOTA

12. Evaluate the following expression: $\sqrt{12+\sqrt{12+\sqrt{12...}}}$
(A) 4 (B) -3, 4 (C) $2\sqrt{3}$ (D) -3 (E) NOTA

13. Solve the following equation for x: $\frac{1}{x-1}+\frac{1}{x+1}=\frac{2}{x^2-1}$.
(A) 1/2 (B) 2 (C) 1 (D) 0 (E) NOTA

14. What is the units digit of 2022^{2022}?
(A) 2 (B) 6 (C) 8 (D) 4 (E) NOTA

15. Find the equation of a line with a slope of -4 that runs through the point (-6, 3).
(A) $y=-4x-22$ (B) $y-3=-4(x+6)$ (C) $y=-4x+22$ (D) $y+3=-4(x-6)$ (E) NOTA

16. Sagar is eating a three-course meal in Houston, Texas. The first meal costs 10 dollars more than the third meal, which is half the price of the second meal. If the meal costs a total of 70 dollars, what is the product of the prices of the three meals?
(A) 180 (B) 1260 (C) 11,250 (D) 40,320 (E) NOTA

17. What is the simplified form of the expression $\sqrt[5]{-32x^{10}y^5} * \sqrt[3]{8x^{21}y^6}$?
(A) $-4x^9y^3$ (B) $2x^4y^2$ (C) $-2x^4y^2$ (D) $4x^9y^3$ (E) NOTA

18. A line runs through the points (1, -6) and (-2, 36). Which of the four quadrants on the Cartesian plane does the line not pass through?
(A) II, IV (B) III (C) I, III (D) IV (E) NOTA

19. Timothy has 30 coins in his pocket, consisting of quarters, dimes and nickels that add up to \$3.75. If he has 5 more nickels than quarters, and has twice as many quarters than he has dimes, then how much money does Timothy have from nickels and dimes?
(A) \$3.00 (B) \$2.25 (C) \$1.25 (D) \$3.25 (E) NOTA

20. Vibav drinks milk on a daily basis, so he needs a large storage container to make sure he never runs out. He currently has a container that is 18 feet wide, 24 feet long, and 30 feet tall. However, he still isn't satisfied and wants to double the volume of the container by increasing each dimension by the same amount. How many feet must Vibav increase each dimension by to make sure he never runs out of milk again?
(A) 2 (B) 5 (C) 6 (D) 8 (E) NOTA

21. What is the equation of the line with a slope of -7 that passes through the midpoint of a line that passes through the points (2, 5) and (12, 7)?
(A) $y=-7x+55$ (B) $y=\frac{1}{5}x+\frac{23}{5}$ (C) $y-6=-7(x+7)$ (D) $y=-7x+4$ (E) NOTA

22. Anish is running laps around a track. However this is an unconventional track that is shaped as a perfect circle with an area of 256π. After running 4 laps, how far has he run in terms of π?.
(A) 108π (B) 128π (C) 32π (D) 256π (E) NOTA

23. Evaluate the following expression: $50 \div 5(5-3) + 5 \div \frac{1}{5}$

(A) 50 (B) 5 (C) 30 (D) 45 (E) NOTA

24. What is $2.\overline{79}$ as a rational number?

(A) $\frac{279}{99}$ (B) $\frac{2765}{990}$ (C) $\frac{2762}{990}$ (D) $\frac{277}{99}$ (E) NOTA

25. There are 25 prime numbers below 100. How many of these numbers, when subtracted from 100, are still prime numbers?

(A) 6 (B) 8 (C) 10 (D) 12 (E) NOTA

26. What is the product of the first ten whole numbers divided by the sum of the first ten whole numbers?

(A) 3,628,800 (B) 80,640 (C) 0 (D) Undefined (E) NOTA

27. Expand and simplify the following expression: $(4i^3 + 8i^4)^3$

(A) -704i+128 (B) $64i^9 + 8i^12$ (C) 64i+12 (D) $256i^2 - 704i + 384$ (E) NOTA

28. Terry only eats his fruits and veggies if they are red. However his favorite foods are the ones that can be arranged in the highest number of distinct ways. Which of the answer choices is Terry's favorite fruit or vegetable?

(A) PEPPER (B) BEETS (C) TOMATO (D) APPLE (E) NOTA

29. Find the sum of the roots of the expression $3x^2 + 15x - 41$.

(A) -23 (B) 15 (C) $\frac{41}{3}$ (D) -5 (E) NOTA

30. Congratulations! Here's your final question: What is the product of the slopes of two perpendicular lines (assume neither line is parallel to the x- or y-axis)?

(A) $\frac{1}{2}$ (B) 0 (C) -1 (D) 1 (E) NOTA