The choice E. NOTA means that none of the other answers are correct. Good luck!

1. Eli, Dhyan, and Patrick are playing a game. After Eli begins the game by saying 1, each person will say the number that is 2 greater than the previous number. They take turns, with Dhyan going after Eli, Patrick going after Dhyan, Eli going after Patrick, and so on (Dhyan says 3, Patrick says 5, Eli says 7, etc.). Who says 2010?

   A. Eli B. Dhyan C. Patrick D. No one E. NOTA

2. Simplify the following expression where $xy \neq 0$:

   $$x^{-2}x^{19}y^{-18}x^{-16}y^{18}$$

   A. 1 B. x C. y D. xy E. NOTA

3. The Pythagorean Theorem states that, in any right triangle, the sum of the squares of the lengths of the legs is equal to the square of the length of the hypotenuse. If two sides of a right triangle have lengths 3 and 4, what is the sum of all distinct possible values for the length of the third side?

   A. $5 + \sqrt{7}$ B. $5 + 2\sqrt{7}$ C. 12 D. 32 E. NOTA

4. Which of the following is the complete prime factorization of 2010?

   A. $2 \times 5 \times 201$ B. $2 \times 3 \times 5 \times 67$ C. $2^2 \times 3 \times 5 \times 67$ D. $2 \times 3^2 \times 5 \times 13$ E. NOTA

5. What is the slope of the line containing the points $(-1, 3)$ and $(3, -5)$?

   A. -4 B. -2 C. $\dfrac{-1}{2}$ D. 0 E. NOTA

6. The lines $y = x$, $y = -x$, and $y = 5$ bound a triangular region of area K. What is K?

   A. 5 B. 12.5 C. 20 D. 25 E. NOTA

7. Evaluate the expression $ab\left(a^b + b^b\right)$ where $a = 2$ and $b = 3$.

   A. 54 B. 120 C. 210 D. 350 E. NOTA

8. Kavitha the Koala has a ten foot long stick of eucalyptus. If she can eat an 8 **inch** stick in one **minute**, and she eats at a constant rate, how many **seconds** will it take her to eat the entire ten **foot** stick?

   A. 10 B. 15 C. 600 D. 900 E. NOTA

9. Find the sum of the solutions to $|x-3|=2$. Note that $|a|$ denotes absolute value; that is, the distance from a to 0 on a number line.

A. -2 B. 0 C. 2 D. 5 E. NOTA

10. Solve for x: $x+3y=2x+3$.

A. $x=3y+3$ B. $x=-3y+3$ C. $x=y-1$ D. $x=3-y$ E. NOTA

11. Ian has fallen into a deep pit. To escape, he must climb up a net amount of 70 feet. He can climb 10 feet up each day, but at night, he falls down 5 feet. On Day 1, he climbs up his first 10 feet, but that night he falls back 5 feet. On which day does he escape the pit?

A. 12 B. 13 C. 14 D. 15 E. NOTA

12. Evaluate the sum $1+3+5+7+9+\cdots+29$.

A. 150 B. 200 C. 225 D. 841 E. NOTA

13. Given that two lines are parallel, how many of the following four statements must be true?
The two lines have the same: I. equation II. slope III. x-intercept IV. y-intercept

A. 1 B. 2 C. 3 D. 4 E. NOTA

14. Three friends, Wilson, Xander, and Yappy, are in line for a movie. Xander and Yappy must be next to each other. In how many ways can they arrange themselves?

A. 2 B. 3 C. 4 D. 6 E. NOTA

15. To graph the line $3x+4y=12$, Chico plots the points $(0,A)$ and $(B,0)$ and draws the line through those two points. If his graph is correct, what is $A+B$?

A. 3 B. 4 C. 7 D. 12 E. NOTA

16. Evaluate $1+1+1-1+1+1+1+1+1-1+1$.

A. 7 B. 8 C. 9 D. 10 E. NOTA

17. Which is larger: a square with side length 2, or a circle with radius of length 1? The area of the larger shape is k greater than the area of the smaller shape. Is k greater or less than 1?

A. square, greater B. square, less C. circle, greater D. circle, less E. NOTA

18. Given that exactly three of the following statements are true, give the list of all people who have it. Note: Linda is a girl, everyone else is a boy.

Linda has it.	Andrew and Ran have it.	None of the boys has it.
Ian doesn't have it.	Everybody has it.	Ran doesn't have it.
All of the girls have it.	No one has it.	Everybody other than Ran has it.

A. No one
B. Linda
C. Andrew, Linda, Ran
D. Andrew, Linda, Ian
E. NOTA

19. Given that $f(x) = 2x^2 - 4x + 5$, evaluate $f(3)$.

A. 6 B. 10 C. 11 D. 15 E. NOTA

20. There is a pattern in the following table. Use it to find the value of $X + Y$.

4	9	11
6	8	12
13	16	27
19	X	43
23	7	Y

A. 54 B. 56 C. 73 D. 83 E. NOTA

21. Evaluate the following expression using proper order of operations: $(3 + (2 + 3)^2 - 10) \div 9$

A. 2 B. 3 C. 4 D. 5 E. NOTA

22. Ian approaches a bubble gum machine containing 5 red, 3 orange, 5 yellow, 10 green, 6 blue, 2 black, 12 indigo, and 3 violet gumballs. If he can't tell the color of the gumball he gets, how many gumballs must he buy to make sure he has at least one of each of the 8 colors?

A. 8 B. 9 C. 44 D. 45 E. NOTA

23. The scoring for this test is as follows: 4 points for each correct answer, -1 point each incorrect answer, and 0 points for each blank answer. If you were to guess randomly on each question, what is the probability that your score would be a prime number greater than 110? Round your answer to the nearest hundred-thousandth. *Hint: The possible scores are 111, 112, 115, 116, and 120.*

A. .00112 B. .00235 C. .11322 D. .99888 E. NOTA

24. Ashley randomly picks a prime number between 1 and 30. What is the probability that her number can be expressed as the sum of a composite number and a prime number?

A. 50% B. 70% C. 90% D. 100% E. NOTA

25. In simplest radical form, the product

$$\left(\sqrt[3]{9}\right)\left(\sqrt[5]{32}\right)\left(\sqrt[6]{36}\right)$$

can be expressed as $a\sqrt[b]{c}$, where a, b, and c are positive integers. Find $a+b+c$.

A. 11 B. 17 C. 23 D. 59 E. NOTA

26. Let k be the answer to this question. What is the number of ways in which $\frac{k}{2}$ distinct students can stand in a line?

A. 3 B. 6 C. 24 D. need more info E. NOTA

27. Ran is paddling downstream (with the current making him go faster) when he realizes he dropped his calculator somewhere upstream. Calculators are very buoyant, and will travel at the same speed as the current of the water. When he realizes that he lost the calculator, he immediately starts to paddle upstream to look for it. Luckily, he finds it, and returns back downstream. When he again reaches the point where he first realized he dropped the calculator, it has been 6 hours since he turned around to go back upstream. In still water, Ran paddles at 15 miles per hour, and he always paddles at a constant rate. If the speed of the current is 5 miles per hour, how many miles did Ran travel downstream between the time he dropped his calculator and the time he realized he dropped it? Hint: Make use of $d = rt$.

A. 40 B. 60 C. 80 D. 100 E. NOTA

For questions 28-30, consider that:
An integer is *tasty* if all of its digits consist of only 1s and/or 2s and an integer is *yummy* if it is divisible by 12.

28. Which of the following numbers is tasty?

A. 11111711 B. 22121232 C. 12121322 D. 23222212 E. NOTA

29. The number 12121112 is: I. tasty II. yummy

A. I only B. II only C. I and II D. neither I nor II E. NOTA

30. What is the second smallest positive integer which is both tasty and yummy?

A. 12 B. 112 C. 212 D. 1212 E. NOTA