

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

- Tanmay believes that he is a mathematics super hero. He claims that he has the power to prime factorize any number. Karthik is skeptical of Tanmay's claim so, to put his power to the test, he decides to ask him a question: "What is the prime factorization of 2020?" Help Tanmay in convincing Karthik by finding the prime factorization of 2020 for him.
 (A) $2 \cdot 5 \cdot 101$ (B) $2^2 \cdot 5 \cdot 101$ (C) $3 \cdot 5 \cdot 101$ (D) $2^3 \cdot 5 \cdot 101$ (E) NOTA
- Tanmay, offended that Karthik would be so skeptical, decides to fire back with a question of his own asking him to find $625 \cdot 625$. What is the answer to Tanmay's question to Karthik?
 (A) 380625 (B) 525625 (C) 275625 (D) 390625 (E) NOTA
- Rewrite $\frac{2019}{19}$ as a decimal rounded to the nearest hundredth.
 (A) 106.26 (B) 106.27 (C) 107.25 (D) 107.26 (E) NOTA
- What is the next term in the sequence: 50, 65, 95, 140, ... ?
 (A) 190 (B) 200 (C) 195 (D) 205 (E) NOTA
- How many different permutations are there of the word "AIDAN"?
 (A) 60 (B) 120 (C) 240 (D) 30 (E) NOTA
- Let's go a bit deeper! What is the depth of a pool in the shape of a rectangular prism in units, if its length is 10 units, its volume is 395 units³, and its width is 2.5 units?
 (A) 15.75 (B) 15.9 (C) 15.6 (D) 15.7 (E) NOTA
- Find $x \cdot y \cdot z$, given the following equations:

$$\begin{aligned} 2x + 5y + 2z &= -38 \\ 3x - 2y + 4z &= 17 \\ -6x + y - 7z &= -12 \end{aligned}$$
 (A) 24 (B) -48 (C) 48 (D) -24 (E) NOTA
- How many ways can you choose 3 objects from 20 distinct objects?
 (A) 1140 (B) 2280 (C) 6840 (D) 6640 (E) NOTA
- Factor $225x^2 - 90x + 9$ into the form $(ax - b)^2$.
 (A) $(15x - 3)^2$ (B) $(15x + 9)^2$ (C) $(15y - 3)^2$ (D) $(15y + 3)^2$ (E) NOTA
- There is a server in Minecraft called Cosmicpvp, which is basically a custom pvp server where you try to be on top by gaining faction points. The more you get, the higher your ranking is. At the end of the season, the top 7 factions' point totals decreased by a factor of 3 each rank starting from the top (for example, 4th place had three times as many points as 5th place). How many points does the 3rd ranking faction have if the top-ranking faction has 135918 points?
 (A) 15102 (B) 15103 (C) 15104 (D) 15105 (E) NOTA

11. What is the slope of the line passing through the points (15, 7) and (-8, -4)?
(A) $\frac{3}{7}$ (B) $\frac{11}{7}$ (C) $\frac{11}{23}$ (D) $\frac{3}{23}$ (E) NOTA
12. A group of friends, Vishal, Vamsi, Harshil, Shreyas, Dylan, Farzan, and Justin, are playing a little game. This game is simple; throw a frisbee the farthest to win. If Vishal threw it 15.7m, Vamsi threw it 17.2m, Harshil threw it 12.4m, Shreyas threw it 32m, Dylan threw it 11.2m, Farzan threw it 13m, and Justin threw it 8.7m, what is the mean of the lowest and highest distance thrown?
(A) 12.2 (B) 21.6 (C) 12.2 (D) 20.35 (E) NOTA
13. Justin, the Pattern Master, has made a pattern and it starts like this: 8, 11, 17, 26 ... What is the next number in the pattern?
(A) 162 (B) 160 (C) 170 (D) 172 (E) NOTA
14. Mihir was not doing well in school. Instead of trying to raise his grades by studying harder, he devised a plan to annoy his classmates, so they do worse in school. Mihir can annoy his friends, Anjali, Ishan, Rohan, Chris, and Prabhas, using 3 different tools, tacs, cheap toys, and water buckets, on four different days, Monday, Tuesday, Wednesday, and Thursday. How many different combinations of one friend, one tool, and one day can Mihir choose from?
(A) 40 (B) 60 (C) 30 (D) 48 (E) NOTA
15. Solve for the volume of a cone when the radius is 7 and the height is 3 times the radius.
(A) $\frac{1029}{3}$ (B) $\frac{1028}{3}$ (C) $\frac{1027}{3}$ (D) $\frac{1027}{2}$ (E) NOTA
16. If $f(x) = x(x(x(x(3x))))$, what is $f(10)$?
(A) 300 (B) 3,000 (C) 30,000 (D) 300,000 (E) NOTA
17. Rohan consults Prabhas the Psychic to make a prediction about this test. Prabhas says All of the people taking this test will be born in the 21st century. Rohan, obviously not amused, decides to challenge Prabhas and you, the test-taker, with the following question: What is the GCF of 2019 and 21? Get it right and save Prabhas reputation?
(A) 1 (B) 3 (C) 7 (D) 21 (E) NOTA
18. Shreyas and Pranav want to compete in a math race, in which they have to do multiple problems in a given amount of a time, Shreyas got stumped on a problem. Help him out, what's $(7^3)(2^3 - 4^{1.5})(13)(2)$?
(A) 0 (B) 343 (C) 26 (D) 8918 (E) NOTA
19. Criting wanted to buy an awesome Rickards Mu Alpha Theta shirt, that costs \$40 without tax, with a 9.5% tax. While scavenging through his car, Criting found 2 10% discount coupon that can be applied before the tax. Given one can only apply 1 coupon to a product, what's the total price if he bought two shirts?
(A) \$72 (B) \$39.42 (C) \$78.84 (D) \$36 (E) NOTA
20. What is the sum of the first 10 numbers in the Fibonacci sequence, which begins with a first and second term of 1?
(A) 176 (B) 88 (C) 143 (D) 142 (E) NOTA
21. What is the distance from (0, 0) to (10, 24)?
(A) 13 (B) 26 (C) 27 (D) 12 (E) NOTA

22. Given a non-vertical line A with a slope of X and a parallel line B , find the product of the slopes of A and B ?
(A) $\frac{X}{2}$ (B) X^2 (C) X (D) Cannot be determined (E) NOTA
23. What is the product of the roots of the equation $(x + 2)(x + 7)(x + 5) = 0$?
(A) -35 (B) 35 (C) 70 (D) -70 (E) NOTA
24. Tanmay, even though he is over ten years old, still acts like a 5-year-old in 2019. Help him act more mature by finding the tens digit of 5^{2019} .
(A) 1 (B) 6 (C) 2 (D) 5 (E) NOTA
25. What is the sum of the first 15 whole even numbers?
(A) 240 (B) 200 (C) 220 (D) 210 (E) NOTA
26. What is $5 \cdot 25 \cdot 125$?
(A) 15525 (B) 625 (C) 14625 (D) 3125 (E) NOTA
27. There are 11 people in a room. Each person in this room is one of three different heights. If a person can only shake the hand of a person who is the same height as them, what is the maximum number of handshakes that would occur if each person only handshakes one other person?
(A) 11 (B) 10 (C) 5 (D) 6 (E) NOTA
28. You only have a couple of questions left to finish your test! What's $2019(6(11(1(6(2(0(1(9))))))))$?
(A) 0 (B) 2019 (C) 2020 (D) 143351019 (E) NOTA
29. Refer back to Question 10's Minecraft faction server. There is a special sword that is worth 200 million in-game dollars. How many such swords could the top faction buy if they converted their faction points into in-game dollars, if 1 faction point equals 100,000 in-game dollars?
(A) 68 (B) 67 (C) 66 (D) 69 (E) NOTA
30. You made it to the final question! Your final task is to solve for x :
- $$5x + 7y = 2018$$
- $$15x + 6y = 2019$$
- (A) 269 (B) 29 (C) 26 (D) 27 (E) NOTA