

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

1. What is the value of $(6 + 8)^3$
(A) 42 (B) 196 (C) 728 (D) 2744 (E) NOTA
2. Rohan has decided to run for sixth grade president. He knows its a hard job and decides to elect Sina as his campaign manager. Sina decides to make unique campaign posters in the shape of an isosceles triangle. If the triangle has a base length of 24 inches and lateral side length of 13 inches, what is the area of one poster (in inches²)?
(A) 60 (B) 120 (C) 156 (D) 312 (E) NOTA
3. Which of the following properties is shown below?

$$(x + y) + z = x + (y + z)$$

- (A) Associate Property of Addition (B) Additive Identity Property (C) Associative Property of Multiplication
(D) Commutative Property of Addition (E) NOTA
4. Vamsi and Hitesh went shopping for shoes. They visit a mall and notice that only two stores are open, Adidas and Hollister, but thankfully thats all they wear. While in the dressing room of the Hollister store, Vamsi takes 2 jeans, 4 shirts, and 2 pairs of shoes. If an outfit consists of 1 pair of jeans, 1 shirt, and 1 pair of shoes, how many different outfits can Vamsi make with the clothes he picked up?
(A) 3 (B) 16 (C) 8 (D) 20 (E) NOTA
 5. If $a\#b = \frac{2ab}{a+b}$, evaluate $12\#(3\#6)$?
(A) 4.8 (B) 3 (C) 6 (D) 4 (E) NOTA
 6. Erin and Sabrina need to make a cylinder. If they need to make it so that the volume is 20π and the height of the cylinder is 5 units, then what is the radius of the cylinder?
(A) 2.7 (B) 3 (C) 2 (D) 3.4 (E) NOTA
 7. Akash Bhat is a renowned mathematician in Gotham City. During the day he attends Rickards High School, but at night, alongside his partner Jishal Robin Vanapati, he terrorizes MAO competitions as his alter-ego, BHATMAN. If Akash can throw a bhat-a-rang at a speed of 99 mph, and Jishal can throw a Vanapati at a speed of 50 mph, then considering they throw both of their projectiles in a continuously straight line, what is the distance between both projectiles after 15 hours, if there is nothing in their way, nothing pulls the projectiles down, and they are thrown from the same point at the same time?
(A) 735 (B) 764 (C) 44 (D) 150 (E) NOTA
 8. What is the sum of all possible positive even divisors of 1000?
(A) 2186 (B) 1000 (C) 2189 (D) 2184 (E) NOTA
 9. Erin recently joined a soccer team. If she wants to play, she needs to buy cleats. When she finally finds an infant sized cleat, she decides to buy it. But unfortunately, the cleats are at the top of a 180-inch shoe-shelf. If she has a 204-inch ladder, and leans it against the shelf so that the top of the ladder touches the top of the shelf, then what is the distance between the bottom of the shelf to the bottom of the ladder?
(A) 24 in (B) 48 ft (C) 8 in (D) 72 in (E) NOTA

10. What is the least common multiple of 330, 450, and 225?
(A) 4950 (B) 11598 (C) 0 (D) 798 (E) NOTA
11. Rayyan and his hot girlfriend were supposed to have a date at Chick-fil-A at 12:00. His girlfriend, however, is running 3 hours and x minutes late. To pass time, Rayyan decides to calculate the smallest angle between the minute and hour hand on the clock, and finds that angle to be 75° . If x is less than 60, what is the largest possible value of x ?
(A) 20 (B) 25 (C) 30 (D) 40 (E) NOTA
12. What quadrants does the line $y = -45x + 58$ go through?
(A) I, II, III (B) I, II, IV (C) II, III, IV (D) III, IV (E) NOTA
13. Anirudh has an old iPhone 4 that quickly runs out of charge. The first time he charged it, his phone died after 53 minutes. The third time he charged it, it died after 37 minutes. He notices that the number of minutes his phone charge lasts forms an arithmetic sequence. How many minutes will his phone charge last on the last time it is able to provide a phone charge that lasts more than 1 minute?
(A) 21 (B) 16 (C) 5 (D) 4 (E) NOTA
14. Find the slope of the line perpendicular to the line perpendicular to the line $y = 0$.
(A) 1 (B) Undefined (C) 0 (D) $\frac{1}{2}$ (E) NOTA
15. Hitesh loves shoes, but his mom won't give him any extra legs, so he can only wear one pair of shoes a day. If Hitesh has 15 pairs of blue shoes, 10 pairs of red shoes, 5 pairs of yellow shoes, and 2 pairs of special edition family guy Under Armour shoes, what is the probability that Hitesh picks a pair of red shoes, if each pair of shoes is equally likely to be chosen?
(A) $\frac{5}{11}$ (B) $\frac{10}{33}$ (C) $\frac{5}{16}$ (D) $\frac{7}{365}$ (E) NOTA
16. Anagha is a rebel and loves to get ear piercings; however, she is very bad at history and won't be able to get another one if she doesn't bring her test average up to a 70. With the maximum possible score being 100, she has scored a 70, 65, 68, 55, and 62 on her past 5 history tests. If she wants to get another piercing, what is the minimum score she must get on her next test?
(A) 70 (B) 80 (C) 90 (D) 100 (E) NOTA
17. Max and Dhruv like playing soccer together in their free time. Sadly, Dhruv always loses to Max and is determined to score more goals than him in the next game. Dhruv's aim falls on the line $y = 9x - 3$, which is perpendicular to the line he needs to aim on in order to score a goal. Find the equation of the line he needs to aim on if it passes through the point $(9, 4)$.
(A) $y = 9x - 4$ (B) $y = \frac{1}{9}x + 5$ (C) $y = -\frac{1}{9}x + 5$ (D) $y = -\frac{1}{9}x - 5$ (E) NOTA
18. Vamsi really wants a girlfriend, but a couple texts later, he realizes that it's a lot harder than he thought. So, he decides to start playing SIMS 4 in hopes of having some sort of success in the virtual world. If Vamsi can get 17 girlfriends in 30 minutes in the first 4 hours of playing SIMS, and 5 girlfriends every 12 minutes in the next 10 hours, how many girlfriends will he have after playing for 7 hours, if he doesn't take a break and doesn't suffer from fatigue?
(A) 210 (B) 211 (C) 174 (D) 158 (E) NOTA
19. Tanvi loves watching the Flash and wants to make a Flash suit for Halloween. How many different ways can the letters in the word HALLOWEEN be arranged?
(A) 362880 (B) 90720 (C) 181440 (D) 126 (E) NOTA

20. Which of the following is a possible point-slope form of the line that passes through the points (4,6) and (12,5)?
(A) $y = -\frac{1}{8}x + \frac{13}{2}$ (B) $y - 6 = -\frac{1}{8}(x - 4)$ (C) $y = \frac{1}{8}x - \frac{13}{2}$ (D) $y - 12 = -\frac{1}{8}(x + 12)$ (E) NOTA
21. Sanjita and Ria love listening to K-pop, especially BTS. They want to go to a BTS concert in Chicago but the ticket price is very expensive. Luckily Ria has a 30% off coupon and uses it on her ticket purchase. Sanjita buys a front row seat ticket for \$550.00 while Ria is cheaper and buys the \$400.00 ticket. What is the final cost of both of their purchases combined?
(A) \$830.00 (B) \$665.00 (C) \$785.00 (D) \$950.00 (E) NOTA
22. Aliana and Aarushi visit the Rickards Zoo that only has penguins and monkeys. They try to count the total number of heads and feet they see in their entire trip. They count a total of 110 heads (assuming both animals have one head) and 300 feet (assuming a penguin has 2 feet and a monkey has 4 feet). What is the total number of penguins they saw at the zoo?
(A) 40 (B) 55 (C) 65 (D) 70 (E) NOTA
23. One ounce of solution STAR contains only ingredients x and y in a ratio of 12:13. One ounce of solution TRIANGLE contains only ingredients x and y in a ratio of 4:5. If solution OVAL is created by mixing solutions STAR and TRIANGLE in a ratio of 5:7, then 1620 ounces of solution OVAL contains how many ounces of y?
(A) 945 (B) 675 (C) 876 (D) 324 (E) NOTA
24. Tanusri and Deekshita like to eat tacos at Moes a lot. Tanusri takes 5 minutes to eat one taco while she and Deekshita together can eat 13 tacos in 40 minutes. How many minutes does Deekshita take to eat 1 taco?
(A) 6 (B) 4 (C) 3 (D) 8 (E) NOTA
25. Rohan needs to latex a lot of tests for this competition. If he can latex 2 tests in 5 minutes, how many can he latex in 314 minutes? (Assuming he never speeds up or slows down).
(A) 100 (B) 124 (C) 785 (D) 123 (E) NOTA
26. If $x + y = 11$, and $xy = 36$, then what is $x^2 + y^2$?
(A) 49 (B) 85 (C) 72 (D) 36 (E) NOTA
27. Find the area of a rhombus in ft^2 with diagonal values of 17 ft and 48 in.
(A) 357 (B) 4896 (C) 816 (D) 68 (E) NOTA
28. Nihar is really bad at chemistry and cannot figure out this problem. He was supposed to have 10 liters of a 15% acid solution, however he only has 10 liters of both a 30% and 10% acid solution. If x liters of the 30% solution and y liters of the 10% solution needs to be mixed to obtain the desired solution, what is the value of $\frac{2(x+y)}{x}$?
(A) 7.5 (B) 8 (C) 10 (D) 3 (E) NOTA
29. If 30% of 45% of 50% of x is 27, and $x = y^2$, what is the value of y?
(A) 25 (B) 20 (C) 50 (D) 36 (E) NOTA
30. If $i = \sqrt{-1}$, find the value of $(x + 3i)(x - 3i)$ in terms of i.
(A) $x + 6i$ (B) $x^2 + 9$ (C) $x^2 - 9$ (D) $x^2 + 6i - 9$ (E) NOTA