

NOTE: "e. None of these answers" is a choice for all questions, in case the answer is not given or there is a problem with the question.

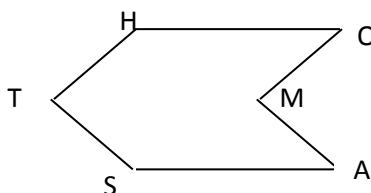
- Solve for x: $6(2x+6) = 7(6x - 9)$.
a. $3\frac{1}{3}$ b. 0.9 c. $\frac{10}{9}$ d. 3.3
- The hardback copy of *Harry Potter and the Deathly Hallows* that Andy is reading contains 784 pages. How many digits did it take to number those 784 pages?
a. 2349 b. 2244 c. 2255 d. 2362
- . At progress report time Austin had test scores of 88, 94, 91 and 85. He wants a final average of at least 90. What is the minimum average he must score on the next two tests to achieve that average?
a. 90 b. 91 c. 90.5 d. 91.5
- Simplify: $\frac{\frac{3}{4} + \frac{2}{5}}{\frac{3}{4} - \frac{1}{5}}$
a. $\frac{23}{11}$ b. $\frac{5}{2}$ c. $\frac{11}{23}$ d. $\frac{2}{5}$
- Zoe is graphing a line with a slope of $\frac{1}{3}$ and an x-intercept of -5 . What is the equation of her line?
a. $y = \frac{1}{3}x + 5$ b. $3x - y = -5$ c. $3y = x + 5$ d. $y = \frac{1}{2}x - 3$
- Richard's 12-gallon tank is being filled at the rate of $\frac{1}{4}$ gallon per 6 seconds. At this rate, how many minutes will it Richard take to fill the tank?
a. 120 minutes b. 288 minutes c. 5 minutes d. 4.8 minutes
- For integer $n > 5$, n divides 205 with a remainder of 5. For how many distinct values of n is this true?
a. 4 b. 7 c. 6 d. 8
- Preston, Peyton and Chandan, along with 47 others, were in the half-pipe finals in the last Winter Olympics. If gold, silver and bronze medals are awarded, what is the probability that these will be the three top winners?
a. $\frac{1}{19600}$ b. $\frac{1}{117600}$ c. $\frac{1}{14700}$ d. $\frac{1}{39200}$
- Find $\frac{AB}{C}$ if A = the number of minutes in a day, B = the largest prime factor of 1001, and C= the number of distinct arrangements of *mathteam*.
a. $\frac{1780}{504}$ b. $\frac{26}{7}$ c. $\frac{263}{34}$ d. $\frac{27}{8}$
- Find the sum: $1 + 3 + 5 + 7 + \dots + 35$
a. 324 b. 625 c. 1225 d. 180

11. Find the area of the figure THOMAS:

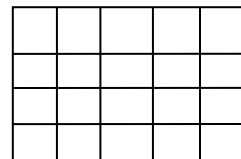
$$TH = 5 = TS = OM = MA$$

$$HO = 8 = AS$$

$$HS = 8 = OA$$



- a. 48 sq units b. 64 sq units c. 80 sq units d. 52 sq units
12. Sophia chooses number tiles that represent the factors of 12 and places them in a bag. Amanda then randomly chooses two of them together. What is the probability that the product of the two chosen numbers is also a factor of 12?
- a. $\frac{1}{12}$ b. $\frac{8}{15}$ c. $\frac{2}{15}$ d. $\frac{7}{12}$
13. Find the distance between the points (5, 8) and (3, 5).
- a. $\sqrt{13}$ b. $\sqrt{12}$ c. $\sqrt{15}$ d. $\sqrt{24}$
14. If $a \nabla b = a(b^2 - a)$, find the value of $(3 \nabla 2) \nabla (7 \nabla 3)$.
- a. 335 b. 401 c. 579 d. 736
15. While standing in line at the Medusa coaster at Six Flags, Galien and Jackson read on the note board that the track is 3168 feet long. Their ride (only one round of the tracks) lasted 45 seconds. What is the speed of the roller coaster in miles per hour?
- a. 42 mph b. 45 mph c. 48 mph d. 60 mph
16. If a Christina can read 10 pages in 7 minutes, how many Christinas will it take to read a total of 45 pages in 105 seconds, assuming they all read at the same rate?
- a. 36 b. 20 c. 18 d. 10
17. Will's bag of buttons contains 20% blue buttons, 40% red buttons, and 8 green buttons. If Will blindly chooses 2 buttons, what is the probability that they are both blue?
- a. $\frac{3}{95}$ b. $\frac{3}{100}$ c. $\frac{2}{95}$ d. $\frac{1}{30}$
18. Two concentric circles have radii of 10 and a , respectively. If $a < 10$ and the smaller circle has an area of $\frac{1}{4}\%$ of the larger one, what is a , the radius of the smaller circle?
- a. 5 b. .25 c. .5 d. 2.5
19. In the rectangle full of rectangles shown here, how many rectangles are there?



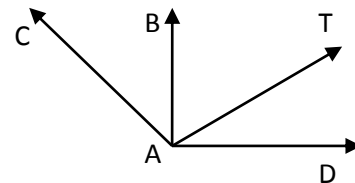
- a. 225 b. 210 c. 135 d. 150

20. What is the sum of the 7th and 12th terms in the arithmetic sequence?

1, 4, 7, 10, . . .

- a. 53 b. 78 c. 63 d. 68

21. The measure of angle CAT is 90, as is the measure of angle BAD. What is the sum of the measures of angles CAD and BAT?



- a. 210° b. 150° c. 180° d. unable to determine

22. A linear function f has the result that $f(n) - f(n-1) = 13$ for all real numbers n . Find $f(9) - f(5)$.

- a. 13 b. 65 c. 52 d. 45

23. What is the sum of the proper divisors of 512, if "proper divisors" are positive but do not include the number itself?

- a. 1023 b. 511 c. 255 d. 127

24. A sequence of numbers begins with 4, then -3, with the n^{th} term defined as $a_n = a_{n-1} - a_{n-2}$. What is the sum of the first 75 terms of the sequence?

- a. 0 b. -6 c. 6 d. -10

25. Let $\odot(a,b,c) = \sqrt{b^2 - 4ac}$. Find the value of $A + B$ if

$A = \odot[(\odot(1,3,2), \odot(4,5,1), \odot(1,6,9))]$

$B =$ the positive value of b where $\odot(5,b,20) = 0$

- a. 24 b. 23 c. 27 d. 48

TIE-BREAKERS. Answer on the back of your scantron sheet.

1. Find the sum: $1 + \frac{2}{1 + \frac{2}{1 + \frac{2}{1 + 1}}}$

2. Kerri leaves Huntsville at 6:35 AM as the engineer of a train traveling to Mobile at 80 mph. Radhika leaves Mobile at 8:00 AM driving her train to Huntsville along a parallel track at 95 mph. At the time they swoop past each other and wave out their windows to each other, which of them is closer to Huntsville?

3. Find the area of a circle which is inscribed in a square with a diagonal of length 6.