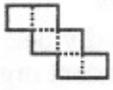
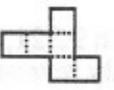
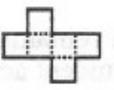
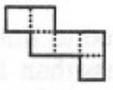
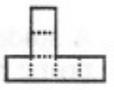


1. One factor of $4x^2 - 17x + 15$ is
 A. $4x - 5$ B. $4x + 3$ C. $4x - 3$ D. $2x - 3$ E. $2x + 5$
2. Five houses in a row are painted five different colors. Neither the red nor the yellow house is on an end; neither the green nor the yellow house is between the red and white houses; the black house is between the green and yellow houses. The middle house is
 A. red B. green C. white D. black E. yellow
3. Which of the following lines is perpendicular to the line with equation $Ax + By = C$?
 A. $y = Bx - A$ B. $Bx + Ay = C$ C. $Ax - By = C$ D. $Bx - Ay = 0$ E. none of these
4. $\sin^2 \frac{5\pi}{12} + \cos^2 \frac{7\pi}{12} =$ A. $\frac{1}{2}$ B. 1 C. $\frac{5}{4}$ D. $\frac{3}{2}$ E. none of these
5. Which of the patterns below CANNOT be folded along the dashed lines to form a cube?
 A.  B.  C.  D.  E. 
6. If $i = \sqrt{-1}$, then $(2 + 3i)(4 - i) =$
 A. -5 B. $5 + 10i$ C. $8 - 3i$ D. $11 + 10i$ E. $6 + 2i$
7. $(\log_4 x)(\log_{1/4} x) =$
 A. 1 B. $-(\log_4 x)^2$ C. $-2 \log_4 x$ D. 0 E. none of these
8. How many distinct points of intersection do the graphs of $f(x) = x^3 - x^2 - 2x + 6$ and $g(x) = x^2 + 2x - 2$ have in the xy -plane?
 A. 0 B. 1 C. 2 D. 3 E. more than 3
9. In $\triangle ACD$, point B is between A and C, $AB = BD$, $m\angle ABD = 130^\circ$, and $m\angle C = 60^\circ$. Then $m\angle ADC =$
 A. 60° B. 70° C. 95° D. 130° E. none of these
10. A car travelling at constant speed reaches the back end of a train travelling in the same direction at constant speed on an adjacent track and then takes 6 minutes to reach the front of the train. At that moment the car slows by 10 mph, and after 9 more minutes the car is at the back end of the train once again. How long is the train?
 A. 1 mi B. $\frac{4}{5}$ mi C. $\frac{3}{4}$ mi D. $\frac{1}{2}$ mi E. none of these
11. $(\sqrt[6]{9})(\sqrt[4]{27}) =$
 A. $3^{12\sqrt{3}}$ B. $3^{\sqrt{3}}$ C. 3 D. $3^{\sqrt[4]{3}}$ E. $\sqrt[6]{243}$

12. The area of the region in the xy -plane lying above the x -axis and below the graph of $y = 4 - |2x - 1| - |2x + 2|$ is
- A. $\frac{7}{4}$ B. $\frac{7}{2}$ C. $\frac{3}{4}$ D. 2 E. none of these
13. In $\triangle ABC$, $AB = 3$, $AC = 7$, and $m\angle B = 60^\circ$. Then $BC =$
- A. $3\sqrt{3}$ B. $\sqrt{58}$ C. $2\sqrt{10}$ D. 5 E. 8
14. Let a , b , c , and d be nonnegative integers such that $1993 = 1a + 9b + 9c + 3d$. If $b + c$ is as large as possible and $a + d$ is as small as possible, then $a + d =$
- A. 0 B. 1 C. 2 D. 3 E. 4
15. $(a^{-1} + b^{-1})^{-1} =$
- A. $\frac{a + b}{ab}$ B. $\frac{ab}{a + b}$ C. $a + b$ D. $\frac{1}{a + b}$ E. $\frac{1}{a^2} + \frac{1}{b^2}$
16. A student is asked to find the four remainders when 9,321,856,407 is divided by each prime number less than 10. The student accidentally reverses two adjacent digits before dividing, yet gets all four remainders correct. One of the reversed digits was
- A. 0 B. 2 C. 6 D. 8 E. 9
17. Two fair dice are each labelled with the letters A, M, A, T, Y, C. If the two dice are rolled once, the probability that at least one of the two top faces shows an A is
- A. $\frac{1}{3}$ B. $\frac{1}{2}$ C. $\frac{5}{9}$ D. $\frac{2}{3}$ E. none of these
18. A fraction has value $\frac{3}{5}$. If the numerator and denominator are both increased by 5, the resulting fraction has value $\frac{7}{10}$. The sum of the original numerator and denominator is
- A. 8 B. 12 C. 17 D. 24 E. none of these
19. The Hawaiian alphabet has 12 letters, 5 of which are vowels and the rest consonants. A syllable in Hawaiian is either a single vowel or a consonant followed by a vowel. The number of possible two-syllable words in Hawaiian is
- A. 1190 B. 1225 C. 1560 D. 1600 E. 3600
20. Hurst Rent-a-car charges \$20 per day plus 20¢ a mile for the first 100 miles and 8¢ a mile for all miles after the first 100. Amos Rent-a-car charges \$22 per day plus 12¢ a mile for all miles driven. On a one-day rental, for how many miles M driven is it cheaper to rent from Amos?
- A. $M > 25$ B. $25 < M < 150$ C. $25 < M < 250$ D. $M < 150$ E. never