

Middleton 4/10/04

Algebra I Individual Test January Regional

NOTA means "None of the above" answers is correct.

1. What property says that for all real numbers a , b , & c , if $a = b$ and $b = c$, then $a = c$?
A. reflexive B. symmetric C. transitive D. trichotomy E. NOTA
2. If p and q are natural numbers, then which of the following expressions is also a natural number?
A. $p + q$ B. $p - q$ C. $\frac{p}{q}$ D. \sqrt{pq} E. NOTA
3. If u and v are integers, then $\frac{u}{v}$ is always a member of which of the following sets?
A. whole numbers
B. natural numbers
C. integers
D. irrational numbers
E. NOTA
4. E and F are two numbers on the real number line. G is a number on the real number line between E and F and is one fourth of the distance from E to F starting from F . If $E = \frac{3}{2}$ and $F = \frac{9}{4}$. Find the value of G .
A. $\frac{27}{16}$ B. $\frac{15}{8}$ C. $\frac{33}{16}$ D. $\frac{15}{4}$ E. NOTA
5. If a and b are real numbers, then which of the following statements must be true?
A. $|a + b| = |a| + |b|$
B. $|a - b| = |a| - |b|$
C. $|ab| = |a| \cdot |b|$
D. $-\frac{|a|}{|b|} = -\frac{a}{b}$
E. NOTA
6. The city of Arlington, Texas, fines a driver who is charged with speeding \$71 plus \$3 for each mile over the speed limit. How many miles over the speed limit is a person driving if he is fined \$128?
A. 19 B. 20 C. 21 D. 22 E. NOTA

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7. Marilyn has taken three math tests with scores 96%, 88%, and 80%. She will take two more tests before the term is over, and one of the two remaining tests will be ten percentage points higher than the other test. If her final average for all 5 tests is 90%, what is the higher of the two remaining test scores?
- A. 85% B. 88% C. 95% D. 98% E. NOTA
8. When it is 9:00 a.m. in the Eastern Time zone, it is 6:00 a.m. in the Pacific Time zone. You fly from California, which is in the Pacific Time zone, at 5:50 p.m. and arrive in New York, which is in the Eastern Time zone. The flight includes $5\frac{3}{4}$ hours of flight time and two stops, each one half hour in length. What time will it be in Eastern Standard Time when the plane arrives in New York?
- A. 11:35 p.m. B. 12:35 a.m. C. 2:35 a.m. D. 3:35 a.m. E. NOTA
9. In 2002, the average cost for a home nationwide was \$135,000. Assuming there is a 3% rate of increase per year in the cost of an average home, what would be the percent of increase to the nearest percent of the value of the average home from 2002 to 2007?
- A. 15% increase B. 16% increase C. 17% increase D. 18% increase E. NOTA
10. A bowling league gives each bowler a handicap to keep the participants competitive. To calculate a participant's handicap, take 90% of the difference between 200 and the participant's average. The first three games are used to establish an average and a handicap. A participant scores 120, 135, and an unknown third score. The participant's handicap is 72 as a result of the three initial scores. What was the participant's third score?
- A. 104 B. 109 C. 129 D. 144 E. NOTA
11. An angle has a complement and a supplement. If the complement's measure is fifteen less than twice the angle measure, find the supplement of the angle.
- A. 35 B. 55 C. 125 D. 145 E. NOTA
12. The measure of a base angle of an isosceles triangle is ten less than twice the measure of its vertex angle. Find the sum of the measures of one base angle and the vertex angle.
- A. 40 B. 70 C. 110 D. 140 E. NOTA

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13. Alice wishes to calculate the number of miles her car has traveled per gallon of gasoline and compare it to the published statistic of 30 miles per gallon of gasoline. She pumps gas into her car and recalls that the last time she put gas in her car, she filled the thirteen-gallon tank. She again fills the tank and records that she has pumped 12.375 gallons. She also records that the car's odometer has gone from 24,758 miles at the last fill-up to 25,154 miles at the current fill-up. What is the difference between her calculation and the published statistic?

- A. 0 B. 1 C. 2 D. 3 E. NOTA

14. A repair company charges \$50 for the first hour and \$40 for each additional hour. How much would the repair company charge for h hours of repair work?

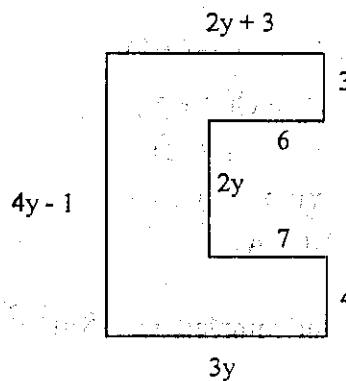
- A. $50 + 40h$
B. $40h - 50$
C. $50 + 40(h - 1)$
D. $50 - 40(h - 1)$
E. NOTA

15. Express $8^x \cdot 2^{1-3x}$ in simplest form.

- A. 2 B. 2^{6x-1} C. 2^{3x-9x^2} D. 16^{x-3x^2} E. NOTA

16. The perimeter of the figure below is 66. Find the value of y .

- A. 3
B. 4
C. 5
D. 6
E. NOTA



17. Simplify: $(x^3 + 5)^2$.

- A. $x^6 + 10$
B. $x^6 + 25$
C. $x^6 + 10x^3 + 25$
D. $x^9 + 10x^3 + 25$
E. NOTA

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18. A rectangular shaped concrete slab has width w units. The length is three units more than the width. The concrete slab is expanded so that each side is two units longer. Find the new area of the expanded concrete slab in terms of w .

- A. $2w+3$
- B. $2w+5$
- C. w^2+3w
- D. $w^2+7w+10$
- E. NOTA

19. Simplify: $(2n^2 - 5n - 4)(3n^2 - n + 1)$.

- A. $6n^4 - 17n^3 - 5n^2 - n - 4$
- B. $6n^4 - 17n^3 - 15n^2 - 9n - 4$
- C. $6n^4 - 27n^2 - 4n - 4$
- D. $6n^4 - 5n^2 - 4$
- E. NOTA

20. Factor completely: $x^2 + x + xy + y$.

- A. $(x+1)(xy+1)$
- B. $(x+1)(x+y)$
- C. $x(x+y+2)$
- D. $xy(x+1)$
- E. NOTA

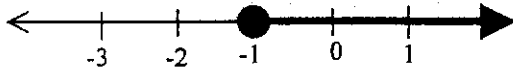
21. Factor completely: $48m^5n^2 - 44m^4n^3 - 60m^3n^4$.

- A. $4m^2n^3(3m+5n)(4m-3n)$
- B. $4m^3n^2(3m-5n)(4m+3n)$
- C. $4m^2n^3(3m+4n)(5m-3n)$
- D. $4m^3n^2(3m-4n)(5m+3n)$
- E. NOTA

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22. The graph below is the solution for which of the following inequalities?



- A. $3x - 1 \leq 2$
- B. $5x + 2 \leq 4x + 1$
- C. $7(x + 2) \geq 5x + 12$
- D. $5(x - 3) \geq 3(x + 5) + 2$
- E. NOTA

23. Find the value of k so that the slope of the line passing through $(-3, 2)$ and $(k, -6)$ is $-\frac{16}{5}$.

- A. $-\frac{1}{2}$
- B. $\frac{1}{2}$
- C. $\frac{11}{2}$
- D. $\frac{113}{2}$
- E. NOTA

24. Which of the following statements is true about the graph of the system below?

$$\begin{cases} 2x - 3y = -3 \\ 3x + 2y = -1 \end{cases}$$

- A. The two lines are parallel to each other.
- B. The two lines are perpendicular to each other.
- C. The two lines intersect each other but are not perpendicular.
- D. The two lines have the same graphs.
- E. NOTA

25. For what value of a would the system below be parallel?

$$\begin{cases} ax + 2y = 4 \\ 2x + 3y = 9 \end{cases}$$

- A. $\frac{8}{9}$
- B. $\frac{4}{3}$
- C. 2
- D. 3
- E. NOTA

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26. Write the equation in standard form of a line that contains $(-6,-3)$ and $(-2,7)$.

- A. $x + 2y = -12$
- B. $2x + 5y = -27$
- C. $4x - 5y = -39$
- D. $5x - 2y = -24$
- E. NOTA

27. The graph of the line $y = -3$ is _____.

- A. increasing
- B. decreasing
- C. horizontal
- D. vertical
- E. NOTA

28. Find the intersection for the system below.

$$\begin{cases} 3x + y = 7 \\ 2x + y = 5 \end{cases}$$

- A. $(1,2)$
- B. $(2,1)$
- C. $(-1,2)$
- D. $(-2,-1)$
- E. NOTA

29. The school chorus performed a concert in which adult and child tickets were sold. Adult tickets cost \$5 each, and child tickets cost \$3 each. There were a total of 300 tickets sold, and the total amount collected was \$1,340. How many more adult tickets were sold than child tickets?

- A. 60
- B. 80
- C. 140
- D. 220
- E. NOTA

30. Which of the following points is not a solution of the following system?

$$\begin{cases} 2x - 3y < 6 \\ x \geq 0 \\ y \leq 2 \end{cases}$$

- A. $(2,1)$
- B. $(1, -\frac{4}{3})$
- C. $(1,2)$
- D. $(4,1)$
- E. NOTA