February Regional **Algebra 1 Individual Test**

Work each problem carefully. Mark the letter for your answer on your Scantron. For each question, choice E. NOTA means "none of the above answers is correct".

1. In a string ensemble, the ratio of men to women is 5: 3. If there is a total of 24 people, how many women are in the group?

A. 8 B. 9 C. 12 D. 15 E. NOTA

2. A phone call costs 5 cents per minute for the first 10 minutes and 15 cents per minute for each minute over 10 minutes. How many minutes long was a call that cost $1.10?

A. 10 B. 14 C. 18 D. 22 E. NOTA

3. For all $x \neq 4$, simplify $\frac{x^2 - 8x + 16}{x^2 - 16}$.

A. $-4x$ B. $\frac{x+4}{x-4}$ C. $\frac{x-4}{x+4}$ D. $\frac{x-8}{x-16}$ E. NOTA

4. On Monday, Ben visits a food stand and buys a chicken sandwich and two sodas for a total of $3.75. On Wednesday, he visits the same food stand and buys two chicken sandwiches and a soda for $5.25. What is the price of a chicken sandwich?

A. $0.75 B. $1.50 C. $2.25 D. $2.50 E. NOTA

5. Simplify $12\left(\frac{1}{4}x + \frac{1}{3}\right) - \frac{1}{2}(12x - 6)$.

A. –3x + 7 B. 3x + 7 C. 4 D. –5x + 3 E. NOTA

6. Solve $3w - 13 = \frac{1}{4}(52 - 12w)$.

A. –1 B. $\frac{13}{3}$ C. Identity D. Ø E. NOTA

7. Solve $30a^3 + 50a^2 - 20a = 0$. What is the sum of the solutions?

A. $\frac{-5}{3}$ B. $\frac{-1}{6}$ C. 1 D. $\frac{5}{2}$ E. NOTA

8. Simplify $3x^6\left(\frac{-1}{3}x^6\right)$.

A. $-9x^6$ B. $-x^6$ C. $-x^{36}$ D. $-x^{12}$ E. NOTA

9. A team won 57 games and lost 18. What percent of all games did the team win?

A. 3.16% B. 24% C. 31% D. 76% E. NOTA

10. Chandra is drawing a map. If she lets 1.5 cm represent 175 km, how long should she draw a segment that represents 875 km?

A. 2 cm B. 5 cm C. 7.5 cm D. 10 cm E. NOTA

11. Simplify $-3c^2(2c+7)+4c(3c^2-c+5)-2(c+2)^2$.

A. $6c^3-27c^2+28c+8$ C. $6c^3-29c^2+4c-16$ E. NOTA

B. $6c^3-27c^2+12c-8$ D. $6c^3-27c^2+20c-8$

12. Multiply $(c-6)(c^2+2c+3)$.

A. $c^3-4c^2-9c-18$ C. $c^3-12c-18$ E. NOTA

B. $c^3+4c^2-15c+18$ D. $c^3-17c-18$

13. Divide $(27x^3+8)$ by $(3x-2)$.

A. $9x^2+4$ C. $9x^2-6x+4$ E. NOTA

B. $9x^2+6x+4$ D. $9x^2+6x+4+\frac{16}{3x-2}$

14. Find the sum of $\frac{a^2}{a^2-b^2}$ and $\frac{a}{(a-b)^2}$.

A. $\frac{a^2+a}{a^2-b^2}$ C. $\frac{a^3-a^2b+a^2+ab}{(a+b)(a-b)}$ E. NOTA

B. $\frac{a^2+a}{a-b}$ D. $\frac{a^3-a^2b+a^2+ab}{(a+b)(a-b)(a-b)}$

15. Solve for **y** in the equation $\frac{xy+z}{2}=a$.

A. $y=\frac{2a+z}{x}$ C. $y=\frac{2a-z}{x}$ E. NOTA

B. $y=2ax-zx$ D. $y=2ax+zx$

16. Express 234 million in scientific notation.

A. 2.34×10^{-8} C. 234×10^{6} E. NOTA

B. 2.34×10^{-6} D. 234×10^{8}

17. Write an equation in slope-intercept form of the line that is parallel to $y=-\frac{1}{3}x$ and that passes through the point (3, 4).

A. $y=\frac{-1}{3}x+5$ C. $y=\frac{-1}{3}x-5$ E. NOTA

B. $y=5x-\frac{1}{3}$ D. $5y=\frac{-1}{3}x$

18. Solve $c^2-10c-20=0$.

A. $\{-5+3\sqrt{5},\ -5-3\sqrt{5}\}$ C. $\{3\sqrt{5}+5,\ 3\sqrt{5}-5\}$ E. NOTA

B. $\{-3\sqrt{5}+5,\ -3\sqrt{5}-5\}$ D. $\{5+3\sqrt{5},\ 5-3\sqrt{5}\}$

19. Solve $|x-6|<2$.

A. x = 8 or x = 4 C. x > 4 and x < 8 E. NOTA

B. x < 8 or x > 4 D. x > –8 and x < –4

20. Solve $\frac{1}{a-1}+\frac{3}{3a-1}=0$.

A. 0 B. $\frac{2}{3}$ C. $\frac{3}{2}$ D. Ø E. NOTA

21. Express $\frac{x^2-36}{6x+36}\div(6-x)$ in simplest form.

A. –6 B. $\frac{1}{6}$ C. 1 D. 6 E. NOTA

22. Solve the system of equations: $\begin{matrix}3s-5t=27\\ s+4t=-8\end{matrix}$. Note: ordered pairs are in alphabetical order.

A. (4, -3) B. (4, 3) C. (14, 3) D. (3, 14) E. NOTA

23. The denominator of a fraction is 7 more than the numerator. If 5 is added to each, the value of the resulting fraction is $\frac{1}{2}$. Find the original fraction.

A. $\frac{2}{9}$ B. $\frac{1}{2}$ C. 2 D. $\frac{9}{2}$ E. NOTA

24. Simplify $\sqrt{16}+3\sqrt{8}-2\sqrt{2}$ completely.

A. $4+3\sqrt{2}$ B. $4+5\sqrt{2}$ C. $4+4\sqrt{2}$ D. $8\sqrt{2}$ E. NOTA

25. A chemist has 10 mL of a 20% salt solution. How many milliliters of water should she add to produce a 5% salt solution?

A. 18 mL B. 22 mL C. 30mL D. 36 mL E. NOTA

26. The sum of a positive integer and the square of the next consecutive integer is 131. Find the sum of the two integers.

A. 19 B. 20 C. 21 D. 22 E. NOTA

27. Solve $(a-25)^2=9$.

A. {2, –8} B. {2, –2} C. {2, 8} D. {22, 28} E. NOTA

28. Find the discriminant of $2x^2-3x-2=0$.

A. –25 B. –7 C. 7 D. 25 E. NOTA

29. Rationalize the denominator of $\frac{\sqrt{3}}{\sqrt{3}-2}$.

A. $-3-2\sqrt{3}$ B. $\frac{\sqrt{3}}{5}$ C. $\frac{3+2\sqrt{3}}{5}$ D. $3+2\sqrt{3}$ E. NOTA

30. Simplify $\frac{x^2+5x+6}{x^2+5x+4}\bullet\frac{x+1}{x-1}\div\frac{x^2+x-6}{x^2+3x-4}$.

A. 1 B. $\frac{x+2}{x-2}$ C. $\frac{x-1}{x+2}$ D. $\frac{x+2}{x-1}$ E. NOTA