

For all questions on this test, answer choice "e" is nota which means None of these answers

1. What property is shown by this statement: $7 + (4 \cdot 3) = (4 \cdot 3) + 7$

- a) Commutative Property of Multiplication
- b) Commutative Property of Addition
- c) Associative Property of Addition
- d) Distributive Property of Multiplication Over Addition
- e) Nota

2. What is the most accurate name for the following set of numbers: $\{\dots, -2, -1, 0, 1, 2, 3, \dots\}$

- a) Reals
- b) Integers
- c) Wholes
- d) Rationals
- e) nota

3. Evaluate the expression $\frac{(2y-z)^3 + y^3}{(2x-z+y)^3}$ if $x = 5$, $y = 2$, and $z = 3$. Give your answer in lowest terms.

- a) $\frac{1}{729}$
- b) $\frac{7}{729}$
- c) $\frac{1}{81}$
- d) $\frac{9}{125}$
- e) nota

4. Solve for x: $x - \frac{3}{5}x + 6 = 18$

- a) -20
- b) $\frac{24}{5}$
- c) 30
- d) 60
- e) nota

5. Which of the following is located farthest to the left on the numberline:

$$0.\bar{7}, \quad \frac{\pi}{4}, \quad \frac{5}{7}, \quad -\left(-\frac{13}{16}\right), \quad \frac{8}{11}$$

- a) $-\left(-\frac{13}{16}\right)$
- b) $0.\bar{7}$
- c) $\frac{5}{7}$
- d) $\frac{\pi}{4}$
- e) nota

6. A ship must average 22 miles per hour to make its ten-hour run on schedule. During the first four hours, bad weather caused it to reduce its speed to 16 mph. What should its average speed be for the rest of the trip to keep the ship to its schedule?

- a) 28 mph
- b) 27.5 mph
- c) 25 mph
- d) 24.8 mph
- e) nota

7. What is the sum of the integer solutions of the compound inequality:

$$5 - 2x + 6 \leq 3x + 4 \quad \text{and} \quad 7 - x > x - 5$$

- a) 14
- b) 15
- c) 20
- d) $\{ \}$
- e) nota

Algebra I

February Regional

8. Find the greatest common factor of 180 and 1,386

- a) 5,220 b) 36 c) 18 d) 9 e) nota

9. Simplify: $\left(\frac{a^3b^2c}{3}\right)^4 \cdot \left(\frac{-3a^2b^4c^2}{2}\right)^3 \cdot (6ab^5c^3)^2$

- a) $\frac{3}{2}a^{20}b^{30}c^{16}$ b) $\frac{3}{2}a^{19}b^{30}c^{13}$ c) $-\frac{3}{2}a^{22}b^{30}c^{19}$ d) $-\frac{3}{2}a^{20}b^{30}c^{16}$ e) nota

10. Simplify the following expression: $(3x^2 - 5x - 7) - (6x^2 - 8x + 1)$

- a) $-3x^2 - 13x - 8$ b) $-3x^2 + 3x - 8$ c) $-3x^2 + 3x - 6$ d) $-3x^2 - 3x - 8$ e) nota

11. During the Great Depression, 9 pounds of potatoes cost the same as 6 pounds of apples. At the same time, 1 pound of potatoes cost twice as much as a pound of onions, while 1 pound of apples cost 8 cents more than a pound of onions. Determine the total cost of one pound of each item.

- a) 20¢ b) 24¢ c) 82¢ d) \$1.60 e) nota

12. Factor $18x^2 - 9x - 20$ into the form $(Ax+B)(Cx+D)$. What is the value of $A+B+C+D$?

- a) 0 b) 4 c) 6 d) 10 e) nota

13. Find the sum of the integer solutions of $|5 - 3x| < 10$

- a) 0 b) 7 c) 9 d) 13 e) nota

14. Jim is x years old. His brother Jeff is x^2 years old. In 8 years, Jeff will be twice as old as Jim is then. What will be the sum of their ages in 5 years?

- a) 16 b) 20 c) 22 d) 30 e) nota

15. Which is an equation in point slope form for the line containing the points $(5, -1)$ and $(1, -5)$?

- a) $(y + 1) = 1(x - 5)$ b) $(y - 1) = 1(x - 5)$ c) $(y - 5) = 1(x - 1)$ d) $y + 1 = -1(x - 5)$ e) nota

16. If the solution to the following equation is expressed as a decimal, what digit is in the tenths place?

$$\frac{3x}{5} - \frac{x-3}{2} = \frac{2}{3}$$

- a) 8 b) 5 c) 4 d) 3 e) nota

Algebra I**February Regional**

17. If $f(x) = x^2 - 4$ and $g(x) = x^2 - 9$, what is the value of $f(g(f(\sqrt{7})))$?

- a) -4 b) -2 c) 0 d) 4 e) nota

18. What is the slope of the line which contains $(5, -2)$ and $(1, 8)$?

- a) -2.5 b) $\frac{2}{5}$ c) $\frac{3}{2}$ d) $\frac{5}{2}$ e) nota

19. If $a - 5 = b$, what is the value of $|a - b| + |b - a|$?

- a) 10 b) 0 c) 5 d) -5 e) nota

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

- a) $12x^2 - 20x + 29$ b) $14x^2 - 10x + 29$ c) $14x^2 + 21$ d) $12x^2 - 20x + 21$ e) nota

21. If $x - y = 10$ and $x^2 - y^2 = -20$, what is the value of $5xy$?

- a) 120 b) -120 c) 24 d) -24 e) nota

22. A car radiator has a capacity of 32 pints and is filled with a 25% antifreeze solution. How much must be drained off and replaced with pure antifreeze to obtain a 40% antifreeze solution?

- a) 14.4 pints b) 9.6 pints c) 6.4 pints d) 4.8 pints e) nota

23. Solve for x: $\frac{x+7}{x-3} = \frac{-3}{2}$

- a) $\frac{-23}{5}$ b) -3 c) -1 d) 23 e) nota

24. Solve the following system of equations. Find the value of $6x - 3y$.

$$\begin{aligned} \frac{2}{x} + \frac{1}{y} &= 3 \\ \frac{3}{x} - \frac{2}{y} &= 8 \end{aligned}$$

- a) 6 b) 3 c) 0 d) -3 e) nota

Algebra I**February Regional**

25. Which of the following points is a solution of $2x - 5y > 5$?

- a) (5, 1) b) (-3, -3) c) (2.5, 0) d) (3, 2) e) nota

26. Henita's grades on the first 4 tests are 85, 92, 97, and 78. Her goal is to have a final average of at least 90. There will be one more test. What must she make on the last test to achieve her goal?

- a) 92 b) 94 c) 96 d) 98 e) nota

27. For what value of k does the equation $4x - ky = 2$ contain the point (3, 2) ?

- a) -7 b) $\frac{10}{3}$ c) $-\frac{10}{3}$ d) -5 e) nota

28. The numerator of a fraction is a two-digit number. The denominator is the 2-digit number that results from reversing the digits of the numerator. The value of the fraction is $\frac{4}{7}$. If the sum of the digits of the numerator is 12, what is the product of the digits of the numerator?

- a) 32 b) 35 c) 36 d) cannot tell e) nota

29. For the system $\begin{cases} 2x + 5y = 18 \\ 3x + 4y = 27 \end{cases}$ what is the value of xy ?

- a) 0 b) 9 c) 63 d) -7 e) nota

30. The domain of the relation $y = -x^2 + 3$ is $\{0, 1, -1\}$. What is the range?

- a) $\{3, 4\}$ b) $\{2, 3, 4\}$ c) $\{2\}$ d) $\{2, 3\}$ e) nota