

SEVENTH ANNUAL MATHEMATICS CONTEST

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THE TENNESSEE MATHEMATICS TEACHERS' ASSOCIATION

ALGEBRA I TEST

1963

Scoring Formula: $4R-W$

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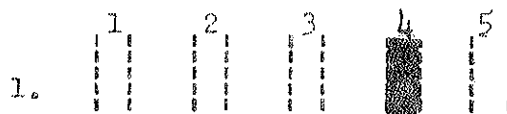
DIRECTIONS:

Do not open this booklet until you are told to do so. For each problem there are listed 5 possible answers. You are to work each problem and determine which is the correct answer, and indicate your choice by making a heavy black mark in the correct place on the separate answer sheet provided. A sample follows:

1. If $2x=3$, then x equals:

(1) $2/3$; (2) 3; (3) 6;

(4) $3/2$; (5) none of these.



The correct answer for the sample question is " $3/2$ ", which is answer (4); therefore, you should answer this question by making a heavy black mark under space 4 as indicated above.

If you should change your mind about an answer, be sure to erase completely.

Avoid wild guessing, as wrong answers count against you. Do not mark more than one answer for any question. Make no stray marks of any kind on your answer sheet.

When told to do so, open your test booklet to page 2 and begin. When you have finished one page, go on to the next page. The working time for the entire test is 80 minutes.

1. If $4a - X = 3a - 4X$, then $X =$

- (1) $-a$; (2) $7/5 a$; (3) $a/5$; (4) $-a/3$; (5) none of these.

2. The number of dimes in $K = 4$ half dollars is:

- (1) $K = 10$; (2) $5K = 20$; (3) $\frac{K-4}{5}$; (4) $\frac{K}{5} = 4$; (5) none of these.

3. Which of the following has a negative root?

- (1) $2X - 1/2 = 3$; (2) $X + \frac{3}{X} = 4$; (3) $\frac{3X-2}{3} = 5$; (4) $4X = 1$;
 (5) $2X = 5 + \frac{3}{X}$

4. The product of 3.5×10^3 and 1.8×10^4 is

- (1) 5.3×10^7 ; (2) 6.3×10^7 ; (3) 6.3×10^{12} ; (4) 5.3×10^1 ;
 (5) 1.8×10^{-1} .

5. $\frac{\sqrt{64}}{\sqrt{25} - \sqrt{16}}$ is equal to

- (1) 8; (2) $8/9$; (3) $2/5$; (4) $8/41$; (5) 6.

6. $(3X + 2)(4X - 5)$ is equal to

- (1) $12X^2 - 10$; (2) $12X^2 - 23X - 10$; (3) $12X^2 + 7X - 10$;
 (4) $12X^2 - 7X - 10$; (5) none of these

7. $\sqrt[3]{-8}$ is equal to

- (1) 2; (2) ± 2 ; (3) -2; (4) 4; (5) $2\sqrt[3]{-2}$

8. $\frac{a^{-1} + b^{-1}}{(a + b)^{-1}}$ is equal to

- (1) $\frac{(a + b)^2}{ab}$; (2) $\frac{1}{ab}$; (3) ab ; (4) $\frac{ab}{(a + b)^2}$; (5) $a + b$

9. Combine:

$$(-3)^4 - (-3)^3 =$$

- (1) $(-3)^7$; (2) $(-3)^1$; (3) $3^3 \cdot 2^2$; (4) 54 ; (5) 3^1 .

10. Which of the following is true?

- (1) $a^3 a^4 = (a^3)^7$; (2) $a^3 + a^4 = a^7$; (3) $\frac{(a + b)^3}{a^3} = b^3$;
 (4) $a^3 a^4 = a^{12}$; (5) $\frac{(ab)^3}{a^3} = b^3$

11. $x^3 + y^3$ factored into real primes is

- (1) $(x + y)(x^2 + 2xy + y^2)$; (2) $(x + y)(x^2 - 2xy + y^2)$
 (3) $(x + y)(x^2 - xy + y^2)$; (4) $(x + y)(x^2 + xy + y^2)$
 (5) $(x + y)(x^2 - y^2)$

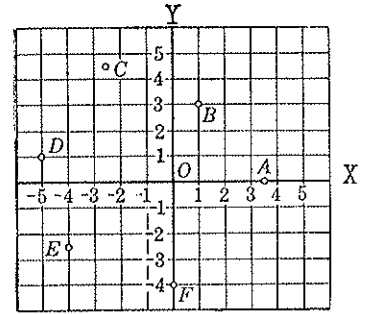
12. Divide bx^3 by $\frac{x^2}{b}$

- (1) b^2x ; (2) bx^5 ; (3) $\frac{x^5}{b^2}$; (4) $\frac{b^2}{x}$; (5) x

13. If a "solution set" is the set of all numbers which satisfy a statement, which is the solution set of $2x + 4 > 16$?

- (1) $x > 6$; (2) $x = 6$; (3) $x = -6$; (4) $x < 6$; (5) none of these

14. $16x^4 - y^4$ factored into its real prime factors is equal to
 (1) $(4x^2 + y^2)(2x - y)^2$; (2) $(4x^2 + y^2)(4x^2 - y^2)$;
 (3) $(4x^2 + y^2)(2x - y)(2x + y)$; (4) $16(x^2 + y^2)(x - y)(x + y)$
 (5) can't be factored
15. $\sqrt[3]{a^5}$ is equal to
 (1) $a^{5/3}$; (2) $a^{3/5}$; (3) $1/a$; (4) $1/a^{3/5}$; (5) $(a^3)^{1/5}$
16. The factors of $4/9 + 1/3x - 3x^2/16$ are
 (1) $(1/9 - x/16)(4 - 3x)$; (2) $(2/9 - x/4)(2 - 3x/4)$;
 (3) $(4/9 - 3x/16)(1 - x)$; (4) $(2/3 - x/4)(2/3 + 3x/4)$
 (5) $4/9 - 3x(1/16 + 1)$
17. If the graph of the equation, $5x + Ky = 9$, passes through the point $(3, -1)$ what is the value of K?
 (1) 24; (2) 16; (3) -6; (4) 6; (5) 4
18. A dealer packed 1800 basketballs in 6 barrels and 6 boxes. Later he packed 2250 basketballs in 9 barrels and 7 boxes. Find the number of basketballs that a barrel will hold.
 (1) 75; (2) 225; (3) 150; (4) 25; (5) none of these
19. If the symbol $|x|$ is read "the absolute value of x" and is equal to x when x is greater than or equal to zero and is equal to $-x$ when x is less than zero, which of the following is always true?
 (1) $|-8| < |5|$; (2) $|a + b| = |a - b|$; (3) $|4 - 5| < 5 - 4$
 (4) $|7| = |-5 - 2|$ (5) $|+a| > |-a|$
20. If a piece of cloth 44 inches long will shrink to 42 inches when washed, to what length in inches will a 33 inch piece of the same cloth shrink after washing?
 (1) $28 \frac{1}{2}$; (2) 31; (3) 32; (4) $31 \frac{1}{2}$; (5) 30



Graph Chart

21. On the graph chart which point has coordinates $(-5, 1)$?
 (1) A; (2) B; (3) C; (4) D; (5) E
22. On the graph chart which point has zero for its ordinate?
 (1) A; (2) B; (3) C; (4) D; (5) E
23. On the graph chart, if the lines $y + 5x + 24 = 0$ and $y + x + 4 = 0$ were graphed, at which point would they intersect?
 (1) A; (2) B; (3) D; (4) E; (5) F
24. When 5 is subtracted from a certain number, N , $1/5$ of the number remains. The equation which expresses this relationship is:
 (1) $N - 5 = 1/5$; (2) $1/5N - 5 = 0$; (3) $5N + 25 = N$; (4) $N - 5 = 1/5N$
 (5) $5N - 25 = 1$
25. If $\sqrt{5} = 2.236$, the value of $\frac{1 + \sqrt{5}}{3 - 2\sqrt{5}}$ to the nearest hundredth is:
 (1) -2.25; (2) -2.35; (3) -2.15; (4) -2.20; (5) -2.50
26. If sulfuric acid is chemically pure, how much water must be added to one quart of acid to make a 10% mixture?
 (1) 1 qt.; (2) 3 qts.; (3) 5 qts.; (4) 7 qts.; (5) 9 qts.
27. If A varies directly as B, and if $A = 5$ when $B = 3$; then the value of A when $B = 15$ is:
 (1) 25; (2) 50; (3) 75; (4) $3/5$; (5) $5/3$
28. If we add its square to a certain number, the sum is 72. Find the number.
 (1) 9; (2) 6; (3) 36; (4) -9; (5) none of these
29. A mechanic agreed to work for 12 days at \$10 for each day that he worked, forfeiting \$5 for each day that he was idle. At the end of the 12 days he received \$75. How many days had he worked?
 (1) 10; (2) 9; (3) 5; (4) 3; (5) none of these

30. If x is positive, which of the following is always less than one?

- (1) $1/x$; (2) x^2 ; (3) $\frac{x}{x+1}$; (4) $\frac{1+x}{x}$; (5) $\frac{1-x}{x}$

31. Solve for x when $\frac{x}{x-1} = 3 + \frac{1}{x-1}$

- (1) 2; (2) -1; (3) 1; (4) -2; (5) none of these

32. A mathematical set is a collection of elements which satisfy a specified condition or conditions and braces $\{ \}$ are used to indicate a set. Which of the following is the set of all positive prime numbers between one and ten?

- (1) $\{2, 3, 4, 5, 7, 9\}$; (2) $\{2, 3, 6, 9\}$; (3) $\{2, 4, 6, 8\}$;
 (4) $\{2, 3, 5, 7\}$; (5) $\{3, 5, 7, 9\}$

33. From the formula $A = 1/2 H(B + C)$, the value of B in terms of A , H , and C is:

- (1) $\frac{2A - HC}{H}$; (2) $(2A - C)H$; (3) $\frac{H}{2A - HC}$; (4) $\frac{HC - 2A}{H}$;
 (5) $H - 2A + C$

34. Combine and Simplify $\frac{2}{6-3x} + \frac{5}{x-2} - \frac{3}{4-2x}$

- (1) $\frac{-35}{6(x-2)}$; (2) $\frac{-35}{6(2-x)}$; (3) $\frac{35}{6(2-x)}$; (4) $\frac{6}{2-x}$;
 (5) $\frac{6}{x-2}$

35. An acre of wheat yielded 2000 pounds more of straw than of grain. The weight of the grain was $3/10$ of the total weight of grain and straw. How many 60-pound bushels of grain were produced?

- (1) 1500; (2) 1200; (3) 500; (4) 25; (5) none of these

36. Find the fraction which equals $\frac{1}{4}$ when 3 is subtracted from the numerator, but equals $\frac{1}{2}$ when 2 is added to the denominator.
- (1) $\frac{3}{4}$; (2) $\frac{8}{5}$; (3) $\frac{2}{3}$; (4) $\frac{5}{8}$; (5) none of these
37. A man has \$3000 invested at $X\%$ and \$2000 at $(X + 1)\%$. The annual interest on the investments totals \$220. Find the X rate.
- (1) 2% ; (2) 4% ; (3) $3\frac{1}{2}\%$; (4) 5% ; (5) none of these
38. A farmer sold 60 hogs for \$2030. Some were sold for \$30, and the remainder were sold for \$40 each. How many were sold at \$30 each?
- (1) 37; (2) 19; (3) 29; (4) 42; (5) none of these
39. The length of service a chair cover will give varies directly as the strength of the fabric and inversely as the amount of wear it receives. If one fabric, which is twice as strong as a second fabric and receives three times as much wear, lasts for 4 years, how long will the second fabric last?
- (1) 9; (2) 4; (3) 2; (4) 6; (5) none of these
40. If $64X^3 - 8Y^3$ is divided by $4X - 2Y$, the quotient will be:
- (1) $4X^2 - 2Y^2$; (2) $4X^2 + 2Y^2$; (3) $16X^2 + 8XY + 4Y^2$;
(4) $16X^2 - 8XY + 4Y^2$; (5) none of these

1. The first part of the document discusses the importance of maintaining accurate records of all transactions.

2. It is essential to ensure that all entries are supported by appropriate documentation.

3. Regular audits should be conducted to verify the accuracy of the records.

4. The second part of the document outlines the procedures for handling discrepancies.

5. Any errors identified during the audit process should be promptly investigated and corrected.

6. It is important to maintain a clear and concise log of all adjustments and corrections.

7. The final section of the document provides a summary of the key findings and recommendations.

8. These findings should be used to improve the overall accuracy and reliability of the financial records.

9. The document concludes with a statement of the auditor's opinion on the overall state of the records.

10. It is recommended that the organization implement the suggested improvements to prevent future errors.

11. The auditor's signature and date are provided at the end of the report.

12. The document is signed and dated as follows:

[Handwritten signature]
Date: _____