Algebra 1 Test

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1. If $17 - 3s = 2$ then what does s equal?

   (A) -5 (B) $19/3$ (C) $-19/3$ (D) 5 (E) None of the above

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2. A 100 meter wire is cut into three pieces. The first piece is twice as long as the second piece. The third piece is one-third as long as the second piece. How many meters long is each piece?

   (A) 60, 25 and 15   (B) 54, 27 and 9   (C) 60, 30 and 10   (D) 65, 25 and 10
   (E) None of the above

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3. All of the solutions to the equation $x^2 = 36$ are:

   (A) $x = \sqrt{6}$ (B) $x = 6$ (C) $x = 0$ and $x = 6$ (D) $x = 6$ and $x = -6$
   (E) None of the above

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4. All of the solutions to the equation $\sqrt{x} = 36$ are:

   (A) $x = 6$ and $x = -6$ (B) $x = 1296$ (C) $x = 0$ and $x = 6$ (D) $x = 216$
   (E) None of the above

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5. If $A = 1,000,000$ which of the following equals $A^{-1/3}$?

   (A) 100 (B) 10 (C) $.1$ (D) $.01$ (E) None of the above

6. Which of the following equations expresses the *commutative law for addition*?

   (A) $a + b = b + a$ (B) $(a + b) + c = a + (b + c)$ (C) $a(b + c) = ab + ac$
   (D) $a(bc) = (ab)c$ (E) None of the above

7. Simplify the fraction $\dfrac{\frac{1}{2} + \frac{9}{16}}{1 - \frac{3}{8}}$.

   (A) 85/128   (B) 1.7   (C) $-20/9$ (D) $-85/48$ (E) None of the above

8. When multiplied out $(2x - 3y)(3x + 5y)$ equals:

   (A) $6x^2 + xy - 15y^2$ (B) $6x^2 + 19xy - 15y^2$ (C) $-9x^2 - 9xy + 10y^2$ (D) $10x^2 - 9xy - 9y^2$ (E) None of the above

9. In 45 minutes a jogger runs a distance of three and a third miles. What is the jogger's average rate of speed in miles per hour?

   (A) $4.\overline{3}$ mph (B) $4.\overline{4}$ mph (C) 4.5 mph (D) $4.\overline{6}$ mph (E) None of the above

10. Express the number $(3^{1/3} \cdot 9^2 \cdot \sqrt{3} \cdot 3^{-1})/27$ as a power of 3.

   (A) $3^{-1/2}$ (B) $3^{5/6}$ (C) $3^{1/6}$ (D) $3^{-2/3}$ (E) None of the above

11. Which of the following is **NOT** equal to $\frac{2}{5} + \frac{3}{12}$?

(A) $\frac{1}{10} + \frac{11}{20}$ (B) $\frac{1}{2} + \frac{3}{20}$ (C) $\frac{5}{4} - \frac{3}{5}$ (D) $\frac{1}{3} + \frac{19}{60}$ (E) None of the above

12. A student travels from her home to her school by running 1/3 of the way, jogging half the way, and then walking the last 3 miles. How far is it from her home to the school?

(A) 8 mi (B) 18 mi (C) 36 mi (D) 64 mi (E) None of the above

13. Solve for t given that $\dfrac{3}{8} = -\dfrac{5}{6}t$.

(A) $-5/16$ (B) $-9/20$ (C) $-1/3$ (D) $-2/5$
(E) None of the above

14. Between 1 and 1000 inclusive how many even integers which are not divisible by 6 are there?

(A) 334   (B) 333   (C) 167   (D) 166   (E) None of the above

15. Let N be the smallest integer for which between 1 and N inclusive the number of even integers which are not divisible by 6 equals 100. What is N?

(A) 512   (B) 300   (C) 298   (D) 256   (E) None of the above

16. The largest whole number N for which 3^N is smaller than $10,000$ is:

(A) 8   (B) 9   (C) 10   (D) 11   (E) None of the above

17. Two years ago Susan invested $4000 in a company's stock. The company had a difficult year and its stock decreased by 10%, however the following year it rebounded and the stock grew by 10%. At the end of the two years how much was Susan's investment worth?

(A) $3960   (B) $3996   (C) $4000   (D) $4040   (E) None of the above

18. The equation $x^2(x^2 - 2)(x^2 - 4)^3 = 0$ has exactly five distinct real solutions. What is the sum of all five of these solutions?

(A) 0   (B) $2\sqrt{2}$ (C) $4 + 2\sqrt{2}$ (D) $2 + \sqrt{2}$ (E) None of the above

19. Of the five numbers $\frac{5}{11}$, $\frac{4}{13}$, $\frac{5}{12}$, $\frac{6}{19}$ and $\frac{4}{12}$, which is smallest?

(A) $\frac{5}{11}$ (B) $\frac{4}{13}$ (C) $\frac{5}{12}$ (D) $\frac{6}{19}$ (E) $\frac{4}{12}$

20. If x is a positive number and $|x - 4| = 5$ what is x?

(A) 1   (B) 9   (C) 0   (D) 29   (E) None of the above

21. If $x = 3.0001$ what whole number is nearest to the value of $\dfrac{x^2 - 9}{x - 3}$?

(A) 0   (B) 3   (C) 6   (D) 9   (E) None of the above

22. The sum of two numbers is 21. One number is four more than the other. What are the numbers?

(A) 6 and 15   (B) 8 and 13   (C) 25/3 and 37/3   (D) 17/2 and 25/2
(E) None of the above

23. Which of the following integers is not prime?

(A) 101   (B) 91   (C) 19   (D) 29   (E) None of the above

24. Which of the following is the prime decomposition of the integer 93600?

(A) $2^4 \cdot 3 \cdot 5^2 \cdot 7 \cdot 11$ (B) $2^3 \cdot 3^2 \cdot 5^3 \cdot 11$ (C) $2 \cdot 3 \cdot 5 \cdot 13$ (D) $2^5 \cdot 3^2 \cdot 5^2 \cdot 13$
(E) None of the above

25. Solve for x: $\dfrac{3}{x - 5} + \dfrac{1}{x + 5} = \dfrac{2}{x^2 - 25}$

(A) $x = -2$ (B) $x = 5$ (C) $x = 1$ (D) $x = 3$ (E) None of the above