

22. If the total value of d dimes and n nickels equals the value of $(n-d)$ quarters, then $d:n =$

- A) 4:7 B) 7:4 C) 1:2 D) 2:1



23. From the 99 integers $\{1, \dots, 99\}$, choose n different integers. If the product of these n integers is 100, the greatest possible value of n is

- A) 2 B) 3 C) 4 D) 5

24. $\frac{1}{x + \frac{2005}{x+2006}}$ is undefined for $\underline{\quad}$ values of x .

- A) 1 B) 2 C) 3 D) 4

25. What is the least positive integer whose square is divisible by 4^{144} ?

- A) 4^{12} B) 4^{72} C) 4^{144} D) 4^{288}

26. $\frac{x^2 + \star + 1}{x+y}$ is equal to $x-y + \frac{1}{x+y}$ whenever $\star =$

- A) $-y^2$ B) xy C) y^2 D) $-xy$

27. If $x^2 - a^2 = 0$ has two real roots, then $\underline{\quad}$ also has two real roots.

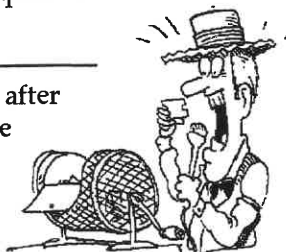
- A) $x-a = 0$ B) $x+a = 0$ C) $x^2 + a^2 = 0$ D) $x^4 - a^4 = 0$

28. If (a, b) is in quadrant II, then $(-a, -b)$ is in quadrant

- A) I B) II C) III D) IV

29. In the sequence 4, 8, 64, \dots , each term after the first is the product of all the positive integer factors of the previous term. What is the fourth term of this sequence?

- A) 2^{36} B) 2^{21} C) 2^{12} D) 2^{11}



30. Any x which satisfies $\underline{\quad}$ also satisfies $1 - |x+1| < 0$.

- A) $x < -2$ B) $x > -1$ C) $x < 0$ D) $x < 1$

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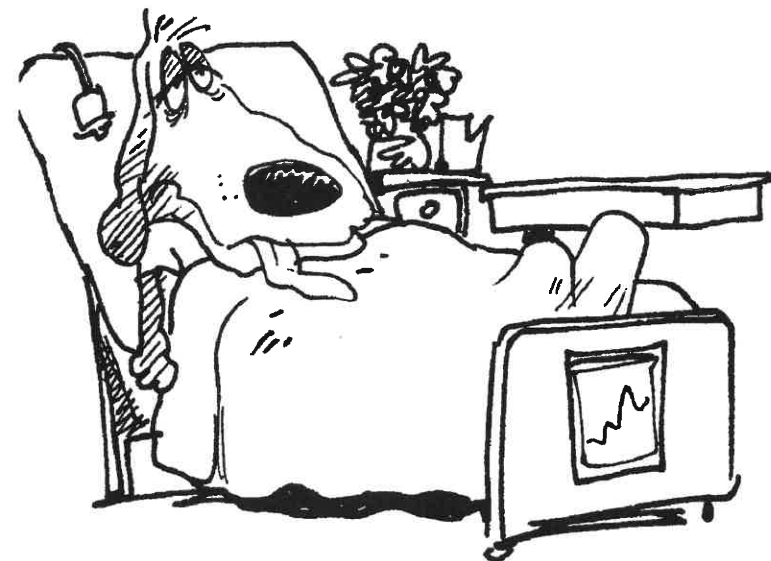
2005-2006 Annual Algebra Course 1 Contest

Spring, 2006

Instructions

A


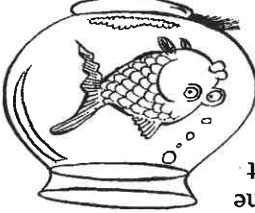
- **Time** You will have only 30 minutes working time for this contest. You might be *unable* to finish all 30 questions in the time allowed.
- **Scores** Please remember that *this is a contest, not a test*—and there is no “passing” or “failing” score. Few students score as high as 24 points (80% correct). Students with half that, 12 points, *deserve commendation!*
- **Format and Point Value** This is a multiple-choice contest. Each answer is an A, B, C, or D. Write each answer in the *Answer Column* to the right of each question. A correct answer is worth 1 point. Unanswered questions get no credit. You **may** use a calculator.






The end of the contest A


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12.	 <p>When I was as sick as a dog, I spent $2x + -x$ days in the hospital. I was in the hospital a total of $\frac{1}{2}$ days.</p> <p>A) $3x$ B) x C) x D) $3 x$</p>
13.	<p>If $x = 1$ billion, which of the following has the greatest value?</p> <p>A) $\sqrt{x_{100}}$ B) x_{20} C) $x_{10}\sqrt{x_{10}}$ D) $x^2\sqrt{x_{50}}$</p>
14.	<p>The product of all real values of x that satisfy $x^2 - 2006 = 0$ is</p> <p>A) 2006 B) 5002 C) $2\sqrt{2006}$ D) -2006</p>
15.	<p>A square whose area is $(x+1)^4$ has a perimeter of</p> <p>A) $4(x+1)^2$ B) $(x+1)^2$ C) $4(x+1)$ D) $(4x+1)$</p>
16.	$\frac{2^4 4^6 \times \dots \times 48 w_{50}}{w_1 w_3 w_5 \times \dots \times 47 w_{49}} =$ <p>A) w_{24} B) w_{25} C) w_{49} D) w_{50}</p>
17.	<p>The number of fish in my fish bowl equals the number of positive integers less than 100 that are both perfect squares and perfect cubes. How many fish are in my fish bowl?</p>  <p>A) 1 B) 2 C) 3 D) 64</p>
18.	<p>If each of three parallel lines has an integral slope, then the product of their slopes <i>cannot</i> be</p> <p>A) -1 B) 0 C) 1 D) 2</p>
19.	<p>If $y = 2x+5$ and $3y = ax+b$ have the same graph, then $a+b =$</p> <p>A) 7 B) 13 C) 21 D) 30</p>
20.	<p>My age in years is a two-digit number. Reversing the digits of my age results in my age 18 years ago. What is the difference between the digits of my age?</p> <p>A) 1 B) 2 C) 3 D) 4</p>
21.	<p>If $\sqrt{M \times A \times T \times H} = M \times A \times T$, then the value of H must be</p> <p>A) $M \times A \times T$ B) $\sqrt{M \times A \times T}$ C) $M^2 \times A^2 \times T^2$ D) 1</p>

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1.	<p>$(2+0+0+6)^{(2 \times 0 \times 0 \times 6)}$</p> <p>A) 1 B) 8 C) 0 D) 8^8</p>
2.	<p>$(-2)(-4)(-6)(-8)(-10) = (1)(2)(3)(4)(5)(?)$</p> <p>A) 2 B) -2 C) 32 D) -32</p>
3.	<p>If $x+1$ scoops of ice cream cost \$3, then $(x+1)+(2x+2)$ scoops of ice cream cost</p> <p>A) \$18 B) \$15 C) \$12 D) \$9</p> 
4.	<p>If $\frac{x^2-4}{x+2} = 8$, then $x-2 =$</p> <p>A) 10 B) 8 C) 6 D) 4</p> <p>5. $(10x)_{100} = (10x_{100})_{(?)}$</p> <p>A) 1 B) 10 C) 10^{99} D) 10^{100}</p>
6.	<p>One value of x for which $x^2 - x < 0$ is</p> <p>A) 2 B) 1 C) 0.5 D) -0.5</p>
7.	<p>How many different positive integers satisfy $\frac{3}{x} > 3$?</p> <p>A) 9 B) 8 C) 6 D) 3</p>
8.	<p>Rectangle R has area 48 and integral side-lengths. The ratio of the length of R's longer side to that of its shorter side <i>cannot</i> be</p> <p>A) 3:1 B) 6:1 C) 12:1 D) 48:1</p>
9.	<p>In my soccer league, the ratio of the number of teams that wear red jerseys to the number of teams that wear blue jerseys is 7:13. What percent of the teams in my league wear red jerseys?</p> <p>A) 70% B) 49% C) 35% D) 20%</p> 
10.	<p>The least common multiple of x^2 and $2x$ is</p> <p>A) $2x$ B) $2x^2$ C) $2x^3$ D) $2x^4$</p>
11.	<p>$x^{18} + 2x^{17} + x^{16} = (?)^2(x+1)^2$</p> <p>A) x^4 B) x^8 C) x^{12} D) x^{16}</p>

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