

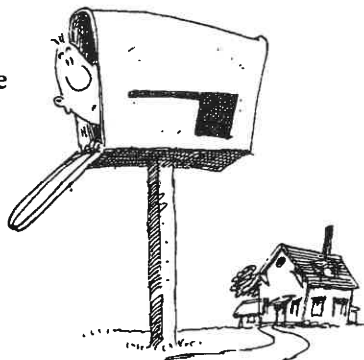
23.  $\sqrt{16^{16}} =$   
 A)  $16^8$       B)  $16^4$       C)  $4^8$       D)  $4^4$

23.

24. If a circle's area is  $3600\pi$ , then its circumference is  
 A) 60      B)  $60\pi$       C) 120      D)  $120\pi$

24.

25. The cheapest way to move is by mail, so each time I move, I mail myself to my new home. I've done this as many times as the number of different integers that satisfy  $(n^2-1)(n^2-2)(n^2-3) = 0$ . How many times did I move by mail?



25.

A) 1    B) 2    C) 3    D) 6

26.  $\frac{1}{x} + \frac{1}{y} + \frac{1}{xy} = \frac{?}{xy}$   
 A) 2    B) 3    C)  $x+y+1$     D)  $x+y$

26.

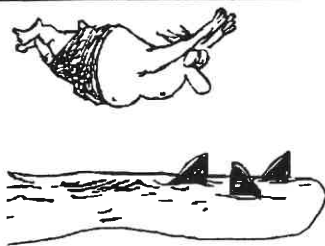
27. If the sum of the squares of two numbers is equal to the square of their sum, then the product of these two numbers must be  
 A) 0      B) 1      C) 4      D) 16

27.

28.  $[(x+1)^2+(x+2)^2+(x+3)^2] - [(x^2+1^2)+(x^2+2^2)+(x^2+3^2)] =$   
 A) 0      B)  $6x$       C)  $9x$       D)  $12x$

28.

29. The number of fish that swam with me is the sum of the digits of the largest integer  $x$  which satisfies  $\frac{x}{x+1} < \frac{2004}{2005}$ . How many fish swam with me?



29.

30. For how many different integral values of  $b$  are both roots of  $x^2+bx-16 = 0$  integers?  
 A) 3      B) 4      C) 5      D) 6

30.

The end of the contest **A**



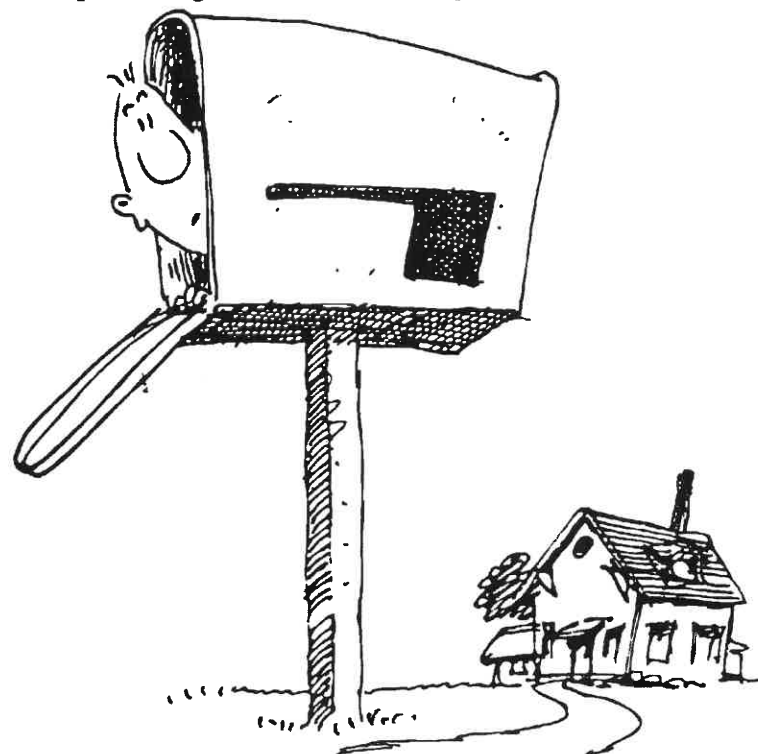
## 2004-2005 Annual Algebra Course 1 Contest


Spring, 2005


## 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.




12.	Of 5 consecutive <i>even</i> integers whose average is $x$ , the smallest is	A) $x-2$ B) $x-3$ C) $x-4$ D) $x-5$
13.	The greatest common factor of $2^{2004}$ and $2^{2005}$ is	A) 1 B) 2 C) $2^{2004}$ D) $2^{2005}$
14.	I ran away with a big prize when I was the 7th caller to know that the slope of every horizontal line is	A) 0 B) 1 C) -1 D) nonexistent
15.	If 10% of $a$ is $b$ , then $a =$	A) $0.1b$ B) $b$ C) $9b$ D) $10b$
16.	For which of the following is $n^n$ the square of an integer?	A) $n = 3$ B) $n = 5$ C) $n = 6$ D) $n = 7$
17.	If $k = \sqrt{2}$ , then the two roots of $x^2 + 4x + k = 0$ are equal.	A) 1 B) 2 C) 3 D) 4
18.	Jesse has worn the same hat for $d$ years. If he wears it for 12 more years, he will have worn this hat for $d^2$ years. For how many years has Jesse worn this hat?	A) 4 B) 6 C) 8 D) 12
19.	 $ x  +  -x  =$	A) 0 B) $ x $ C) $ -x $ D) $2 x $
20.	Circle $C$ 's center is $(0,0)$ , and the length of $C$ 's radius is 5. Which of the following are the coordinates of a point on $C$ ?	A) $(0,5)$ B) $(-5,-5)$ C) $(-10,0)$ D) $(5,5)$
21.	For primes $a$ and $b$ , if $a > b$ , then $ab$ has $\sqrt{2}$ unequal positive factors.	A) 4 B) 3 C) 2 D) 1
22.	The product of $\sqrt{2}$ and $x^{100}$ has the same value as $(-x)^{100}$ .	A) 100 B) 1 C) -1 D) -100

Go on to the next page  **A**

1.	$1^{2005} + 1^{2005} =$	A) $1^{4010}$ B) $2^1$ C) $2^{2005}$ D) $2^{4010}$
2.	From $n$ piles of 12 coconuts each, I am able to make $\sqrt{2}$ piles of 3 coconuts each.	A) $n+3$ B) $n+4$ C) $3n$ D) $4n$
3.	$x^{400} \div x^{100} =$	A) $x^{500}$ B) $x^{300}$ C) $x^4$ D) 4
4.	$(-1)^1 + (-1)^2 + (-1)^3 + \dots + (-1)^{98} + (-1)^{99} =$	A) 1 B) 0 C) -1 D) -99
5.	If $x^2 - y^2 = 10$ , and $x + y = 10$ , then $x - y =$	A) 1 B) -1 C) 10 D) -10
6.	The total value of $2x$ nickels and $x$ dimes is 60¢ when $x =$	A) 6 B) 4 C) 3 D) 2
7.	The least common multiple of 2, 4, and 8 is	A) 2 B) 8 C) 16 D) 64
8.	$2 = \sqrt{8} \div \sqrt{2}$	A) 4 B) $\sqrt{6}$ C) $\sqrt{4}$ D) $\sqrt{2}$
9.	There are 6 more football players wearing dark helmets than wearing light ones. The ratio of dark helmets to light is 2:1. The number of light helmets is	A) 2 B) 3 C) 6 D) 12
10.	The graph of $\sqrt{2}$ is parallel to the graph of $2x + y = -3$ .	A) $2x + y = 3$ B) $2x + 4y = 6$ C) $2x - y = 3$ D) $x + 2y = -3$
11.	Of 5 consecutive integers whose average is $x$ , the smallest is	A) $x-2$ B) $x-3$ C) $x-4$ D) $x-5$



Go on to the next page  **A**