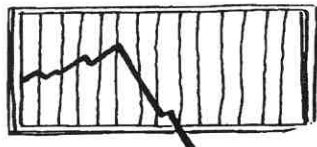


22. $\sqrt{x^{64}} \div \sqrt{x^4} = x^{32} \div x^2 = x^{30}$. A) x^4 B) x^6 C) x^{16} D) x^{30}	22. D
23. The number of times that I danced with a star is $(x+3)^2 - (x-3)^2 = (x^2+6x+9) - (x^2-6x+9) = 12x$. A) 0 B) $3x$ C) $12x$ D) 18	23. C
24. $x^2+x^2+x^2+x^2 = 4x^2 = x^4$, so $x = 2$ & $x^4+x^4+x^4+x^4 = 4x^4 = 64 = 8x^3$. A) x^8 B) $4x^6$ C) $6x^4$ D) $8x^3$	24. D
25. $(x+y)^3 = 1x^3+3x^2y+3xy^2+1y^3$. The coefficients' sum is $1+3+3+1$. A) 8 B) 6 C) 4 D) 3	25. A
26. The square factors are 1, 2^2 , 2^4 , 5^2 , 5^4 , $2^2 \times 5^2$, $2^2 \times 5^4$, $2^4 \times 5^2$, $2^4 \times 5^4$. A) 4 B) 9 C) 16 D) 25	26. B
27. B crosses x -axis at $y = 0$. Only $0 = x^2 - 64$ has unequal solutions. A) $y = (x+8)(x-8)$ B) $y = x^2$ C) $y = (x+5)^2$ D) $y = (x-12)^2$	27. A
28. Since line ℓ has slope $\frac{1}{1+\frac{1}{x}} = \frac{x}{x+1}$, the slope of any line perpendicular to line ℓ is the negative reciprocal of $\frac{x}{x+1}$, and that's choice C. A) $-x$ B) $-\frac{x}{x+1}$ C) $-\frac{x+1}{x}$ D) $-\frac{1}{x+1}$	28. C
29. $10^3+10^4=1000+10000=11000$. Likewise, $10^{2006}+10^{2007}$ has 2008 digits. A) 2007 B) 2008 C) 4013 D) 4015	29. B
30. $(x+y)^2 = 36 = x^2+2xy+y^2$. Since $xy = 4$, $x^2+y^2 = 36-8 = 28$. A) 20 B) 28 C) 32 D) 36	30. B



The end of the contest **A**

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Information & Solutions


Spring, 2007


Contest Information

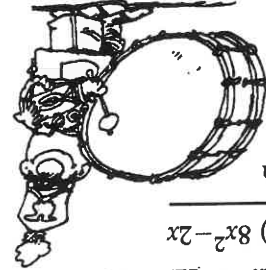
A


- **Solutions** Turn the page for detailed contest solutions (written in the question boxes) and letter answers (written in the *Answers* column to the right of each question).
- **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 30 points (75% correct). Students with half that, 15 points, *deserve commendation!*
- **Answers & Rating Scale** Turn to page 148 for the letter answers to each question and the rating scale for this contest.



12.	D	Slopes of \parallel lines are equal. When each is $\frac{2}{1}$, the sum is $\frac{2}{1} + \frac{2}{1} = 1$.
13.	B	The composite factors of $30 = 2 \times 3 \times 5$ are: $2 \times 3, 2 \times 5, 3 \times 5$, and $2 \times 3 \times 5$. The number of composite factors is 4.
14.	A	If $x < 0$, then $ x-2 = -(x-2) = -x+2 = A$. A) $ x +2$ B) $ x -2$ C) $2- x $ D) $x+2$
15.	C	$(x^2-4)(x^2-16)(x^2-20)(x^2-36) = 0$, so $x = \pm 2, \pm 4, \pm \sqrt{20}, \pm 6$.
16.	D	Since $(1,3)$ and $(6,3)$ lie on a horizontal line, $m = 0$ and $mb = 0$.
17.	C	As shown, A, B, and D are all sums of squares of two integers. A) $17 = 1^2+4^2$ B) $18 = 3^2+3^2$ C) 19 D) $20 = 2^2+4^2$
18.	B	If $x = 1000$, then 1% of $x = \frac{100}{1}(1000) = 10$, and 0.5% of $x = 5$. A) 0.5 B) 5 C) 50 D) 500
19.	C	The sign's width is $(x-6)(x+1)$. Its length is $\frac{1}{(x-3)(x+1)}$. To get its area, multiply. Reduce the result to get $\frac{x-3}{x-6}$. 
20.	A	Since $\sqrt{2007} \approx 44.8$, $x = -44, -43, -42, \dots, -2, -1$. A) 44 B) 45 C) 88 D) 89
21.	C	C is not the product of two binomials with integer coefficients. A) $(x+y)(x+y)$ B) $(x-y)(x-y)$ C) $x^2-2xy-y^2$ D) $(x-y)(x+y)$

Go on to the next page  A

1.	D	$(3+6)^2 = 3^2 + 2 \times 3 \times 6 + 6^2 = 3^2 + 6^2 + 36$.
2.	D	Since $2(x+0) + 0(x+7) = 2x$, and $x = 2007$, $2x = 4014$. A) 2 B) 2007 C) 4007 D) 4014
3.	C	I was able to compute that $(-2)(-3)(-4)(-5) = (-3)(-4)(-2)(-5) = (-3)(-4)(10)$. A) -20 B) -10 C) 10 D) 20
4.	A	If $\frac{b}{a} = -2$, then $a = -2b$, so $2b = -a$. A) $-a$ B) $-4a$ C) a D) $4a$
5.	B	If $x+1 = y$, then $x^2+2x+1 = (x+1)^2 = y^2$. A) $2y+1$ B) y^2 C) y^2+1 D) y^2+2x
6.	B	If $x = 0$, then $x^2 = 0$, its least value. A) $-3 < x < -1$ B) $-2 < x < 1$ C) $0 < x < 1$ D) $1 < x < 2$
7.	A	$10x^2-5x+(-3x)-(-2x^2) = 10x^2-5x-3x+2x^2 = 12x^2-8x$. A) $12x^2-8x$ B) $12x^2-2x$ C) $8x^2-8x$ D) $8x^2-2x$
8.	D	Only 40% of the drummers passed me in the 1st hour, so 60% of the drummers passed me in the 2nd hour. Therefore, 60% = 45, 20% = 15, and 100% = 75.  A) 63 B) 70 C) 72 D) 75
9.	B	Since $x+10$ is odd, x must be odd, so $x+5 = \text{odd}+5$ is even. A) odd B) even C) prime D) positive
10.	D	The roots of $(x-2)(x-3) = 0$ are 2, 3; their product is $2 \times 3 = 6$. A) 0 B) -5 C) -6 D) 6
11.	C	The g.c.f. of $(x+1)(x+1)$ and $(x+1)(x+2)$ is $x+1$. A) 2 B) x^2 C) $x+1$ D) $x+2$

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