

**ALGEBRA ONE TEAM ROUND MARCH 8, 2003 REGIONAL**  
**TEAM QUESTION ONE**

SIMPLIFY LET  $A = -|-3| - 5^2 - 3^0 - (-3)^0 + (-5)^2$

LET  $B = 5 - 3(-2 + 6X) + 3(5X - 4) + 3X - 7$

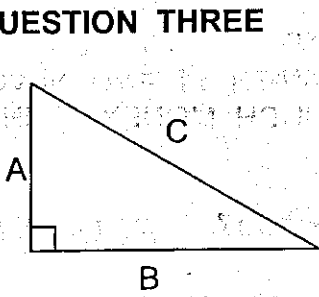
LET  $C = 2^4 - (-4)^3 + 26 \div (4 - (-9)) - 10$

STATE THE VALUE OF  $\frac{AC}{B}$ .

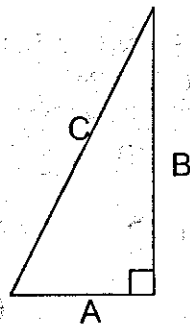
**ALGEBRA ONE TEAM ROUND MARCH 8, 2003 REGIONAL**  
**TEAM QUESTION TWO**

- A. THE PERIMETER OF A POOL TABLE IS 30 FEET. IT IS TWICE AS LONG AS IT IS WIDE. FIND THE NUMBER OF FEET IN ITS LENGTH.
  - B. A COLLECTION OF DIMES AND NICKELS HAS 63 COINS. IF THIS IS \$5.05, HOW MANY OF THE COINS ARE DIMES?
  - C. THE SUM OF ADAM AND ALEX'S AGES IS 30. FIVE YEARS AGO, ALEX WAS THREE TIMES AS OLD AS ADAM. WHAT IS ALEX'S PRESENT AGE?
- STATE THE SUM OF THE NUMBER OF FEET IN THE LENGTH PLUS THE NUMBER OF DIMES PLUS ALEX'S PRESENT AGE.

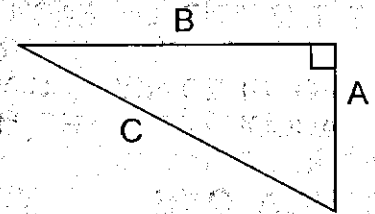
**ALGEBRA ONE TEAM ROUND MARCH 8, 2003 REGIONAL**  
**TEAM QUESTION THREE**



$A = 11$   
 $B = 60$   
 $C = ?$



$A = X$   
 $B = 2X - 1$   
 $C = 2X + 1$



$A = X$   
 $B = X + 1$   
 $C = \sqrt{8X + 1}$

WHAT IS THE SUM OF THE THREE HYPOTENUSES (C's)?

**ALGEBRA ONE TEAM ROUND MARCH 8, 2003 REGIONAL**  
**TEAM QUESTION FOUR**

HOW MANY OF THE FOLLOWING 6 EQUATIONS HAVE AN INFINITE NUMBER OF REAL NUMBER SOLUTIONS?

$2(R - 3) + 5(R + 4) = 9$

$9(2X - 4) = 7(2X - 5) - 1 + 4X$

$3(8X + 1) = 6(4X + 2)$

$5(6 - 3X) = 15(2 - X)$

$5(4X - 1) = 2(10X - 3)$

$9(X + 1) - 3X = 2(3X + 1) - 4$

**ALGEBRA ONE TEAM ROUND MARCH 8, 2003 REGIONAL**  
**TEAM QUESTION FIVE**

STEM	LEAF
1	1 2 4 5 7 9 9
2	0 0 4 5 6 6 7 8
3	1 2 5 5 7 8 8 9
4	3 3 3 3 5 7 8

WHAT IS THE SUM OF THE MEAN PLUS THE MEDIAN PLUS THE MODE?

(KEY  $2|3 = 23$ )

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ALGEBRA ONE

TEAM ROUND

MARCH 8, 2003

REGIONAL

TEAM QUESTION SIX

ARE THE FOLLOWING SETS CLOSED UNDER THE GIVEN OPERATIONS?  
STATE YES OR NO.

THE SET OF ODD NUMBERS UNDER ADDITION?, UNDER MULTIPLICATION?

THE SET OF EVEN NUMBERS UNDER ADDITION?, UNDER MULTIPLICATION?

THE SET  $\{-1, 0, 1\}$  UNDER ADDITION?, UNDER MULTIPLICATION?

FIND THE PRODUCT OF THE NUMBER OF 'YES' AND 'NO' ANSWERS.

ALGEBRA ONE

TEAM ROUND

MARCH 8, 2003

REGIONAL

TEAM QUESTION SEVEN

SOLVE THE FOLLOWING FRACTIONAL EQUATIONS. IF THE FOUR SOLUTIONS WERE WRITTEN IN NUMERICAL ORDER FROM SMALLEST TO LARGEST, WHAT IS THE SECOND LARGEST SOLUTION?

$$\frac{3Y}{Y^2+5Y+6} = \frac{5Y}{Y^2+2Y-3} - \frac{2}{Y^2+Y-2} \qquad \frac{Y}{Y^2+Y-2} + \frac{Y}{Y^2-1} = \frac{Y}{Y^2+3Y+2}$$

ALGEBRA ONE

TEAM ROUND

MARCH 8, 2003

REGIONAL

TEAM QUESTION EIGHT

A. IN THE CORRECT ADDITION PROBLEM TO THE RIGHT,

WHAT IS THE VALUE OF "C" IF A, B, C ARE THREE  
DISTINCT DIGITS?

$$\begin{array}{r} AB \\ + CC \\ \hline AAA \end{array}$$

B. AT THE END OF EACH DAY, MY BANK ADDS \$3 TO MY BANK ACCOUNT FOR EVERY DOLLAR IN MY ACCOUNT. I BEGAN WITH \$1 AND NEVER TOUCHED MY ACCOUNT. AFTER 3 DAYS, HOW MUCH MONEY IS IN MY ACCOUNT? LET M = THE NUMBER OF DOLLARS.

WHAT IS C + M?

ALGEBRA ONE

TEAM ROUND

MARCH 8, 2003

REGIONAL

TEAM QUESTION NINE

A. ONE PIPE CAN FILL A SWIMMING POOL IN 6 HOURS, AND ANOTHER CAN FILL IT IN 12 HOURS. LET A EQUAL THE NUMBER OF HOURS IT WILL TAKE THE TWO PIPES WORKING TOGETHER TO FILL THREE-FOURTHS OF THE POOL.

B. DENNIS CAN DO A JOB IN 4 DAYS. WHEN DENNIS AND SUE WORK TOGETHER, THE JOB TAKES 2 DAYS. LET B EQUAL THE NUMBER OF DAYS IT WOULD TAKE SUE WORKING ALONE.

C. AN INLET PIPE CAN FILL A SWIMMING POOL IN 9 HOURS, AND AN OUTLET PIPE CAN EMPTY THAT SAME POOL IN 12 HOURS. THROUGH AN ERROR, BOTH PIPES ARE LEFT OPEN. LET C = THE NUMBER OF HOURS IT WILL NOW TAKE TO FILL THIS POOL.

D. A COLD WATER FAUCET CAN FILL A TUB IN 12 MINUTES. A HOT WATER FAUCET CAN FILL THE SAME TUB IN 15 MINUTES. THIS TUB'S DRAIN CAN EMPTY THE TUB IN 20 MINUTES. IF BOTH FAUCETS ARE ON AND THE DRAIN IS OPEN, LET D EQUAL THE NUMBER OF MINUTES IT WILL TAKE TO FILL THE TUB.

CALCULATE  $\frac{C}{A+B+D}$

wanted

ALGEBRA ONE TEAM ROUND

MARCH 8, 2003

REGIONAL

TEAM QUESTION TEN

STATE THE SUM OF THE X-COORDINATES OF THE VERTICES OF THE FOLLOWING PARABOLAS:

Y = X^2 - X - 2

Y = X^2 - 3X - 4

Y = -X^2 + 2X + 3

Y = 2X^2 - 8X - 21

ALGEBRA ONE TEAM ROUND

MARCH 8, 2003

REGIONAL

TEAM QUESTION ELEVEN

TWO OF THE FOLLOWING SYSTEMS OF EQUATIONS INTERSECT AT EXACTLY ONE POINT. ADD THEIR CORRESPONDING X AND Y VALUES AND WRITE THIS NEW ORDERED PAIR ON YOUR ANSWER SHEET. (IF THE ORDERED PAIRS WERE (3, -5) AND (-7, -3), YOU WOULD ANSWER (-4, -8).

A. { 3X + 5Y = -7, 5X + 4Y = 10

B. { 5X - 2Y = 6, 10X - 4Y = 10

C. { 6X - 2Y = 12, -3X + Y = -6

D. { 6X - 8Y = 4, 3X - 4Y = 2

E. { 3X - Y = 5, 6X - 2Y = 5

F. { 3X + 2Y = 12, 5X - 3Y = 1

ALGEBRA ONE TEAM ROUND

MARCH 8, 2003

REGIONAL

TEAM QUESTION TWELVE

THE FOLLOWING STATEMENT IS FALSE: 101 - 102 = 1. MOVE ONLY ONE DIGIT AND MAKE THE STATEMENT TRUE. DO NOT REMOVE ONE DIGIT. DO NOT INTERCHANGE DIGITS. MOVE ONE AND ONLY ONE DIGIT SO THAT THE STATEMENT IS TRUE. ON YOUR ANSWER SHEET, WRITE THE NEW STATEMENT THAT IS TRUE AND HAS ONLY ONE DIGIT THAT HAS BEEN MOVED.

ALGEBRA ONE TEAM ROUND

MARCH 8, 2003

REGIONAL

TEAM QUESTION THIRTEEN

STATE THE SUM OF ALL SOLUTIONS TO THE FOLLOWING RADICAL EQUATIONS:

sqrt(6X+7) - 1 = X + 1

sqrt(3X+3) + 5 = X

sqrt(4X+5) = 2X - 5

ALGEBRA ONE TEAM ROUND

MARCH 8, 2003

REGIONAL

TEAM QUESTION FOURTEEN

FIND THE SUM AND THE PRODUCT OF THE ROOTS OF THESE EQUATIONS. NOW ADD THE 6 ANSWERS YOU FOUND.

X^2 - 5X - 6 = 0

X^2 - 5X + 6 = 0

X^2 - 5X - 7 = 0

ALGEBRA ONE TEAM ROUND

MARCH 8, 2003

REGIONAL

TEAM QUESTION FIFTEEN

WHAT IS THE PRODUCT OF THE REMAINDERS TO THE DIVISION PROBLEMS?

(15M^2 + 34M + 28) / (5M + 3)

(6M^4 - 16M^3 + 15M^2 - 5M - 4) / (3M + 1)

(3M^3 + M^2 + 4M + 1) / (M + 1)

5M + 3

3M + 1

M + 1

reworded

reworded