



## Scoring

# Scoring

0:00 - 0:30 10 points

0:31 - 1:00 8 points

1:01 - 1:30 6 points

1:31 - 2:00 4 points

If the first person to answer is correct, they receive  
2 Bonus Points.

# Rules

# Rules

1.

# Rules

## Rules

5. Answers with radicals must be simplified. Denominators must be rationalized.
6. Exponents should be positive.
- 7.

# Sample Problem # 1

## Sample Problem

RESET :

Solve for  $x$  in the equation

$$x^2 - 6x - 3 = 0$$



## Sample Problem

Answer:  $3 + 2\sqrt[3]{3}$  and  $3 - 2\sqrt[3]{3}$ .



# Geometry

Algebra II

Comprehensive Part 1

Comprehensive Part 2

Team

# Geometry

Algebra II

Comprehensive Part 1

Comprehensive Part 2

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# Geometry Question # 1

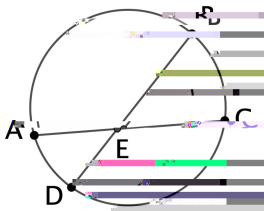


# Geometry Question # 2

## Geometry Question # 2

RESET :

Points  $A$ ,  $B$ ,  $C$  and  $D$  are on the circle, with secant lines  $\overline{AC}$  and  $\overline{BD}$  intersecting at point  $E$ . If  $m\overline{BC} = 60^\circ$  and  $m\angle BEC = 50^\circ$ , find  $m\angle ECD$ , in degrees.



## Geometry Question # 2

Answer:



## Geometry Question # 2

Answer: 20

# Round 1

## Algebra II

# Algebra II Question # 3

## Algebra II Question # 3

RESET :

If  $x = 1$  is a solution to  $x^3 + 2x^2 - 31x + 28 = 0$ , find the larger of the other two solutions.

# Algebra II Question # 3

Answer:



# Algebra II Question # 4







# Algebra II Question # 4

Answer: 9



# Comprehensive Part 1

## Question # 5

# Comprehensive Part 1 Question # 5

RESET

## Comprehensive Part 1 Question # 5

Answer:

# Comprehensive Part 1 Question # 5

Answer:  $\frac{3}{2}; \frac{5}{2}$

# Comprehensive Part 1

## Question # 6



## Comprehensive Part 1 Question # 6

RESET :

If  $\sin \theta = \frac{1}{2}$ , find  $\tan^2 \theta$ .

# Comprehensive Part 1 Question # 6

Answer:

# Comprehensive Part 1 Question # 6

Answer:  $\frac{2}{3}$



# Comprehensive Part 2

## Question # 7

## Comprehensive Part 2 Question # 7

RESET :

Let  $\otimes$  be defined by  $a \otimes b = a^2 + 2^b$ . If  $5 \otimes b = 41$ , what is  $b$ ?  
Provide your answer as an integer or simplified fraction.



# Comprehensive Part 2 Question # 7

Answer: 4



# Comprehensive Part 2

## Question # 8









# Team Question # 9

## Team Question # 9

RESET :

Find the summation of

Volume of a right square based pyramid with a height of 5 and a base side of length 3

+

Measure of an exterior angle in a regular pentagon

+

Radius of circle defined by  $x^2 + 6x + y^2 - 12y = 4$

## Team Question # 9

Answer:



## Team Question # 9

Answer: 94

# Team Question # 10

## Team Question # 10

RESET :

A sequence is defined by  $a_n = a_{n-1} + a_{n-2} + a_{n-3}$  for  $n \geq 4$ .  
Suppose  $a_4 = 20$ ,  $a_5 = 36$ , and  $a_7 = 121$ . What is  $a_3$ ?

## Team Question # 10

Answer:



# End of Round 1