

CSI Algebra: Real Numbers



Detectives,

A thief, working under the alias Guapo Arcsin, has caused a ruckus all throughout Central America. It is believed that Guapo is a member of the evil genius group, the Mathemagicians. From what the detectives have gathered thus far from the previous thefts, the Mathemagicians are building a world conquering device.

Fortunately, Guapo has left behind a trail of notes and a cryptic text message that he has told us will calculate toward his favorite number. Thus far there are six suspects that police have questioned. It is hoped that someone with a relatively strong number sense can crack some codes that have puzzled the detectives on the case so far.

Your job is to bring Guapo to justice and save the planet. Since you are being brought in as a specialist you have to have definitive proof in order for any arrest to hold up in court.

You need to be prepared to state your case and demonstrate your understanding of the following skills that Guapo is known to use in her/his notes.



- Square root approximation
- Decimal, fraction, percent, conversion
- Scientific Notation
- The Real Number System

Be sure to include:

- Other examples of the concepts
- Definitions
- Any other relevant information.

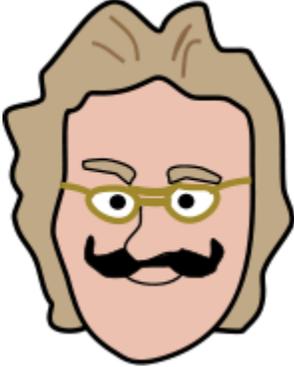
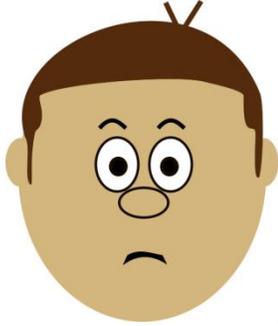
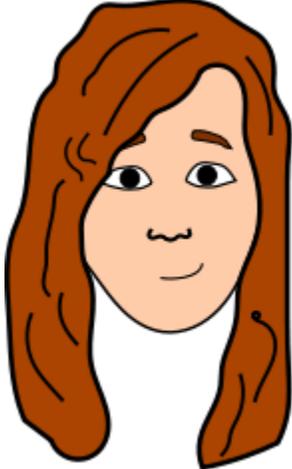
This is not a time to be sloppy. The slightest miscalculation or illegible footnote could result in a not guilty verdict.

Oh, did I mention that use of a calculator might prematurely set off his world conquering device? Good luck to you, gumshoe.

Chief Harris

Who is Guapo Arcsin?



<p>Name: Stillman</p> <p>Occupation: College Student</p> <p>Favorite Number: -7</p> 	<p>Name: Charmelle</p> <p>Occupation: Mechanical Engineer</p> <p>Favorite Number: π</p> 
<p>Name: Hiram</p> <p>Occupation: Doctor</p> <p>Favorite Number: 6</p> 	<p>Name: Logan</p> <p>Occupation: Politician</p> <p>Favorite Number: 13</p> 
<p>Name: Pedro</p> <p>Occupation: Fire Fighter</p> <p>Favorite Number: $\frac{1}{2}$</p> 	<p>Name: Eden</p> <p>Occupation: Organic Food Grower</p> <p>Favorite Number: 0</p> 

Scene #1 Machu Picchu - Peru



At about 12:24, Guapo Arcsin broke into the famous Incan ruins and stole an Intihuatana stone. The Intihuatana is a ritual South American stone used to tell time.

Hello Peru Peeps and Police,

To let you know upfront, I plan on conquering the world. Okay, now that I have your attention, I figure I'll give you a fighting chance to stop me. MuHahahahaha. If found this riddle carved into an Incan temple.

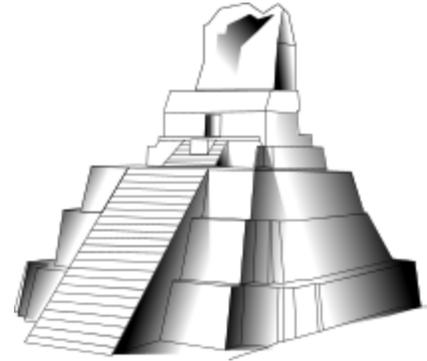


Figure out a number that fits all three of these criteria.

1. A is a WHOLE NUMBER
2. A is a two digit perfect square
3. $A > |-7| + \frac{8^{10}}{8^8}$

Please be aware I will later send you a CRYPTIC PUZZLE SOLVER TEXT MESSAGE.

Sincerely Yours,

A = _____

Guapo Arcsin

Scene #2 Mayan Ruins -- Mexico

Four rare, limestone cornerstones were extracted from the ruins of a Mayan ceremonial platform. These stones could perhaps lay the foundation for a devastating world conquering device.

My Dearest,

Since I haven't been captured yet, I've been thinking about running for Congress! I'll make the next one an easy one. I have run three different opinion polls.



Which one is the best?

G. 11 out of every 20 voters is expected to vote for me!

ñ. The percentage of voters that are expected to vote for me is 54%!

P. There are 240,000 expected to vote, and of these, 130,000 are expected to vote for me!

This letter = -6

_____ = -6

Scene #3 Andes Mountains -- Colombia



Thursday night, Guapo Arcsin traversed the mountains and shaved two dozen alpacas. While it's unclear what he plans to do with the wool, there are now many cold and confused alpacas. He carved this note into the mountain.

Greetings Police Officer,

I see that my first puzzle has befuddled even the best of you. I've made the next one even harder. Remember my World Conquering Device will go off at the touch of a calculator.



1.) Q is a RATIONAL NUMBER

2.)
$$x = \frac{(2.4 \times 10^5) + (1.8 \times 10^5)}{(1.4 \times 10^3)}$$

3.)
$$\frac{60}{x} = Q$$

Q = _____

Give up yet? Your Friend,

Guapo Arcsin

Scene #4 Panama Canal -- Panama

An oiler tanker ship was reported missing from the canal. Apparently the captain decided to go ashore to eat a sandwich and was shocked to find this note in place of his boat.

To Whom It May Concern,

I'm sure you are thoroughly confused by now. Hopefully you don't arrest the wrong person!

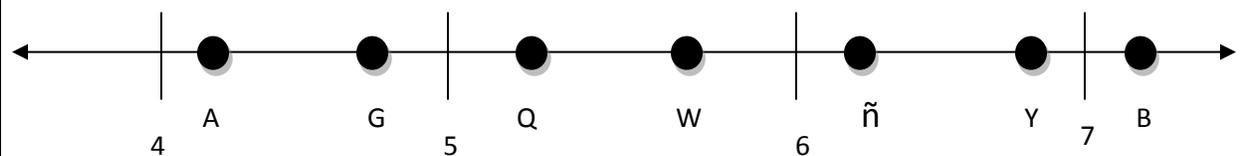


1. A = the denominator of 125/1000 when it is written in lowest terms.

2. B = the number of minutes in a day divided by 360.

3. \sqrt{AB}

4. Mystery Letter = Approximation of \sqrt{AB} on the number line.



Mystery Letter = **32**

_____ = **32**



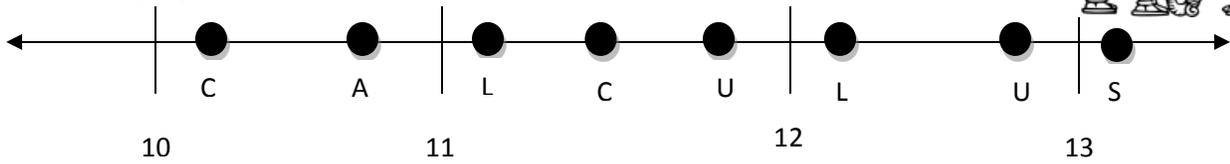
An unknown amount of rubble and multiple Aztec jade masks depicting various gods were stolen. Guapo has successfully robbed the Aztec, Incans, and Mayans. It's unknown what he's capable of...he must be stopped quick.



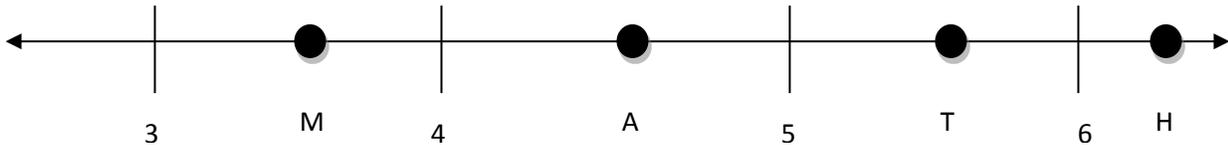
What's Good,

I'm getting bored. I decided to make some of my own wall art.

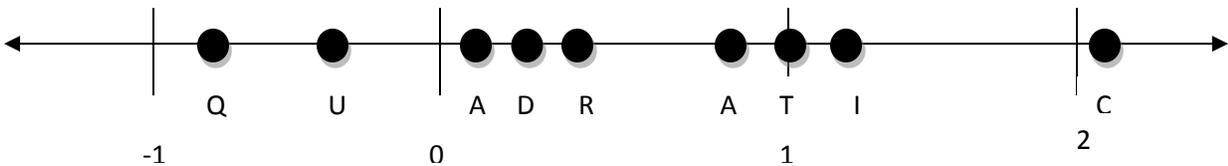
Which point most accurately represents $\sqrt{168}$?



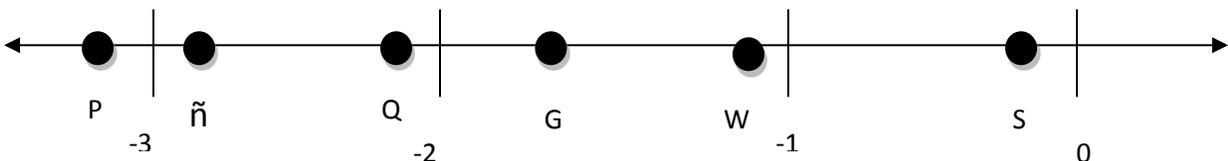
Which point most accurately represents $\sqrt{(\text{number_of_the_letter_in_the_alphabet})}$? Use your previous answer. (HINT: C=3, A=1, L=12 etc.)



Which point most accurately represents $\sqrt{|\text{number_of_the_letter_in_the_alphabet} - 6|}$?



Which point most accurately represents $\sqrt{(\text{number_of_the_letter_in_the_alphabet})} - 5$?



Round your last answer to the nearest integer and you might have figured out me out.

Final Letter = Rounded Answer _____ = _____

We will be deploying our device soon. Good luck.

Happy Holidays,

Guapo Arcsin



Three rare, blind Egyptian six legged mice were stolen from the National Museum of Anthropology. We suspect Guapo Arcsin will be using their abnormal DNA as part of his World Conquering Device.

Hola,

Como estas? Muy bien gracias. I'm liking this Spanishness! I want to play some futbol!



Elegir la respuesta con los números en orden de menor a mayor.

Gato	.185	1.5%	$\frac{1}{2}$	1.2×10^{-2}
Perro	1.2×10^{-2}	1.5%	.185	$\frac{1}{2}$
Pez	$\frac{1}{2}$.185	1.5%	1.2×10^{-2}

\tilde{n} = El número de letras en la palabra es la respuesta.

$\tilde{n} = \underline{\hspace{2cm}}$

Adios Amigos,

Señor Guapo Arcsin

CRYPTIC PUZZLE SOLVER TEXT MESSAGE

omg u arent gonna figure this out my
num is perfect

$$(\tilde{n}-Q\tilde{n})^{(G/P)} - (SQRT(A-W)) - 3Q\tilde{n}$$

rofl Guapo Too Slick Arcsin