

CSI Columbus: Solving Equations



Detectives,

Once again the world has been rocked by a string of high profile robberies. This time it seems the Middle East has been victim of the evil genius group, the Mathemagicians. Notes signed “Kareem Al-Jabr” have been discovered at each of the robbery sites. Once again a cryptic text message was sent, but requires the puzzles to be cracked. We believe the Mathemagicians have been successfully piecing together a world conquering device.

Again we’ve been told the result of the cryptic text message will calculate to Al-Jabr’s 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 Al-Jabr to justice and save the planet. Since you are being brought in as a specialist you have to have definitive proof in order for it to hold up in court.

You need to be prepared to state your case and demonstrate your understanding of the following skills that Al-Jabr is known to use in his notes.

- Translating equations
- Solving equations
- Using Formulas

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 Kareem Al-Jabr?



Name: Bao

Occupation: Insurance Agent

Favorite Number : -20



Name: Trish

Occupation: Lawyer

Favorite Number : 0



Name: Chloe

Occupation: High School Teacher

Favorite Number: 97



Name: Eugene

Occupation: Musician

Favorite Number : $\frac{1}{4}$



Name: Darryl

Occupation: Optometrist

Favorite Number: 9



Name: Rishi

Occupation: Grocer

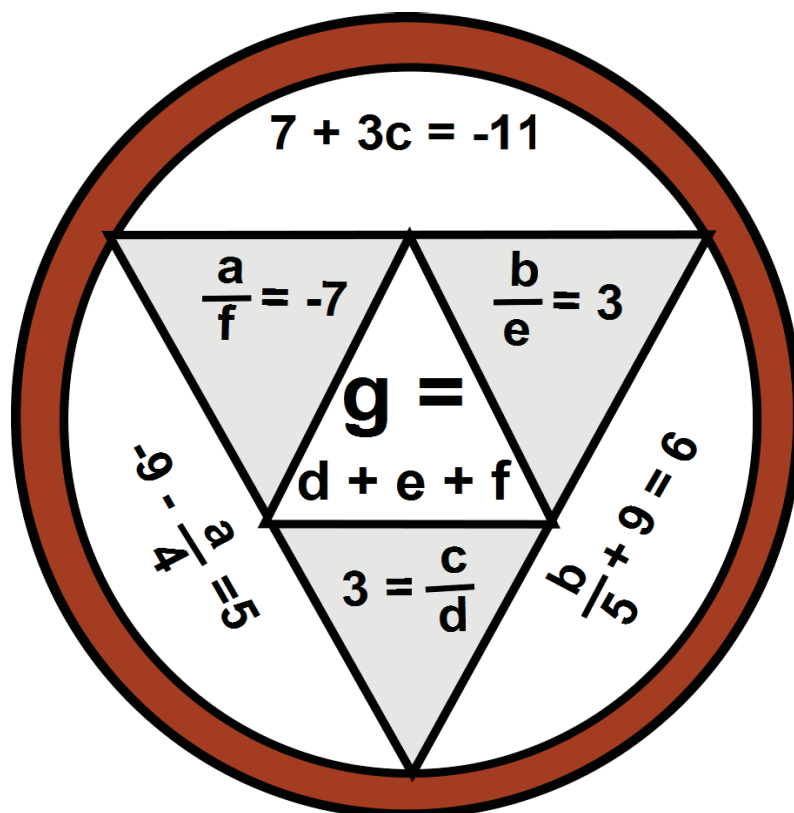
Favorite Number: -210





In the middle of the night, Kareem Al-Jabr softly repelled into the heavily alarmed security system. Al-Jabr most definitely has soft feet and great swag. He left with hundreds of coins from the ancient world.

These coins look really really old. I'll be sellin these on eBay check out my listings @ WorldlySwagg14 . I'm about to knock over the home of Algebra.



g = _____

CRYPTIC PUZZLE SOLVER TEXT MESSAGE

check dis out. You dont got no chance at
dis. $(h - p) \div (9g + \text{🐎}) + \text{Q} - (pv)^g$

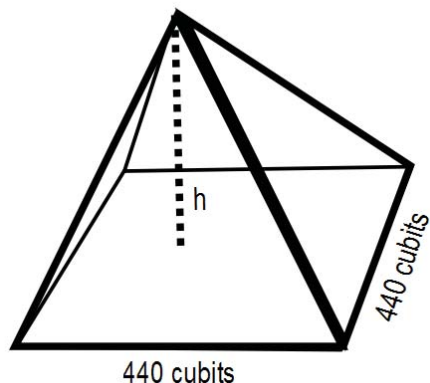
Kareem Master of Swagg Al-Jabr

Scene #2 The Great Pyramids -- Giza, Egypt

Kareem Al-Jabr snuck past Pyramid Security at an unspecified time. While we are unsure what he stole, we are in the process of taking inventory of all the mummies.



Hmmm...so sure the algebra stuff isn't that hard, let see if you can handle some swagg-rific geometry.



The volume of the pyramid is $18,069,333.33333 \text{ cubits}^3$

How tall is it? I'll be a nice person. Here's the formula for the volume of a pyramid: $V = (1/3)lwh$

h = _____

Scene #3 Sphinx -- Giza, Egypt

We suspect after his robbery at the pyramid, Al-Jabr went outside, ate a picnic lunch, and climbed the Sphinx. Our research team suspects, Al-Jabr stole a limestone fragment of the Sphinx's beard.

I so stole a piece of that dude's beard. Check this out, here's some good ol' Egyptian math right off the Rhind Papyrus! I stole that too!

PROBLEM 44.

THE SUM OF A CERTAIN QUANTITY "P" TOGETHER WITH ITS TWO-THIRD, AND ITS HALF BECOMES 234.

WHAT IS THE QUANTITY "P"?



p = _____

Scene #4 Nile River Cruise -- Alexandria, Egypt



After the pair of robberies at Giza, Al-Jabr hopped on a Nile River cruise. He stole a dangerous amount of shampoo.

Living it up on the Nile. Gotta go get my swaggilicious self on the dance floor. Check out these two receipts – I had to pay with Egyptian Pounds after my Swaggcard got denied.

NILE RIVER CRUISE		NILE RIVER CRUISES	
			
Lamb Kabab	£ 120	Kebda	£ 130
Du'aah	£ 0	Torly	£ 35
Mahshi	£ 60	Du'aah	£ 20
Diet Dr. Pepper	£ 15	Water	£ 0
Skittles	£ 20		
Total	X	Total	X

What a coincidence? Both receipts totaled to the same amount... X. I really wish I knew how much a Du'aah cost. They were yummy.

$$\underline{\hspace{2cm}} = 0$$

Scene #5 National Museum of Iraq - Baghdad, Iraq

A baked clay tablet with Hammurabi's Code was found astray this morning. It appears Kareem Al-Jabr was attempting to translate the document.

While my Akkadian is a little rusty, my swagg tells me rule 204 says,

"WHAT YOU DO TO ONE SIDE YOU BETTER DO TO THE OTHER SIDE. OTHERWISE YOUR HAND WILL BE CUT OFF."

i. $3k - 5 = 7k - 33$ ii. $28 - 2.2x = 11.6x - 54.8$ iii. $8f + 12 = 7s + 9$

iv. $k + Vf = x + V$

$$V = \underline{\hspace{2cm}}$$



Etched into the grounds of Babylon, Kareem Al-Jabr left the final note. It's suspected he used Babylonian numerals in this final note.

I was going to etch this a few spots over, but it seems the US military built a helipad in Babylon. Good thing it's not an ancient civilization that should be cherished forever. Well at least they didn't crush the ground with their tanks. Oh wait, are those tank tracks?

$$\overline{\text{Y}}\overline{\text{Y}}\overline{\text{Y}}\left(\text{𐎶} + \overline{\text{Y}}\right) = \overline{\text{Y}}\overline{\text{Y}}\left(\text{𐎶} - \overline{\text{Y}}\overline{\text{Y}}\overline{\text{Y}}\overline{\text{Y}}\overline{\text{Y}}\overline{\text{Y}}\right)$$

$$\text{𐎶} = \underline{\hspace{1cm}}$$