Mathematics on T.V.

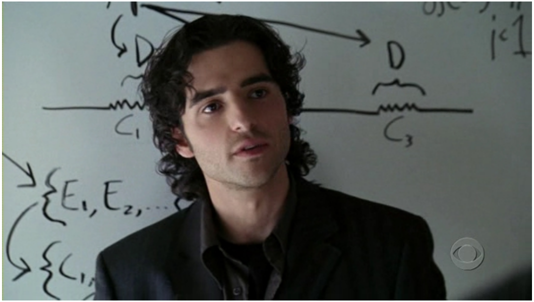
Rhian Davies

February 26, 2014

Mathematics and Statistics
LANCASTER UNIVERSITY

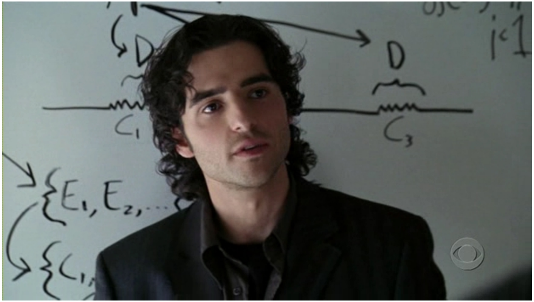
NUMB3RS

"We all use math every day; to predict weather, to tell time, to handle money. Math is more than formulas or equations; it's logic, it's rationality, it's using your mind to solve the biggest mysteries we know."

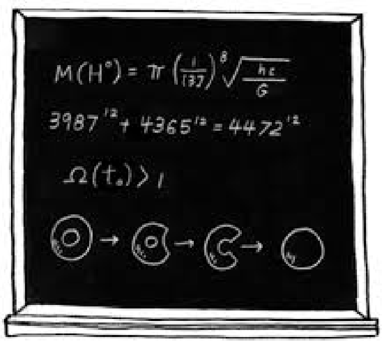


NUMB3RS

"We all use math every day; to predict weather, to tell time, to handle money. Math is more than formulas or equations; it's logic, it's rationality, it's using your mind to solve the biggest mysteries we know."



"Getting the math right and getting it to fit with the plot are not priorities for the NUMB3RS team"


$M(H^\circ) = \pi \left(\frac{1}{137}\right)^8 \sqrt{\frac{hc}{G}}$
$3987^{12} + 4365^{12} = 4472^{12}$
$\Omega(t_0) > 1$

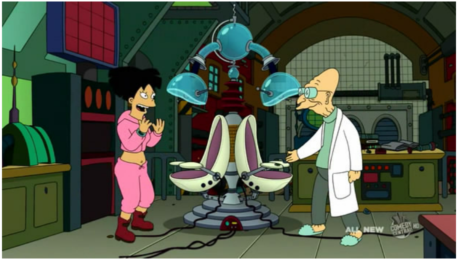
- In 1637, Fermat stated that he can prove that the equation

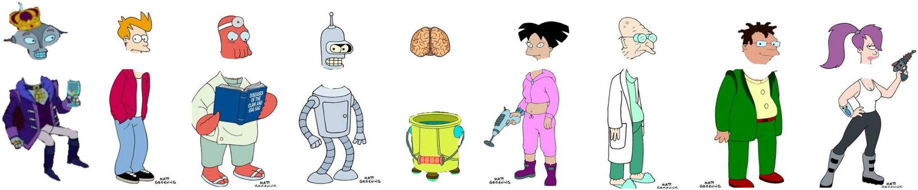
$$x^n + y^n = z^n \qquad \text{for} \qquad (n > 2), \tag{1}$$

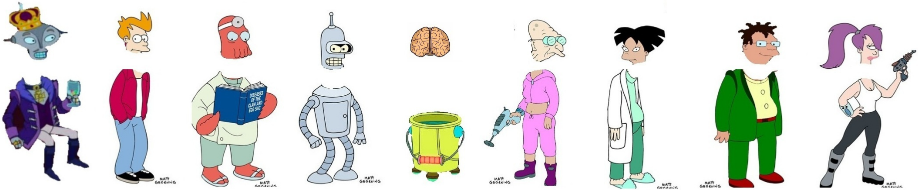
  has no whole number solutions.
- He didn't ever write this "proof" down and died before telling anyone.
- Over 350 years later, in 1995 Andrew Wiles discovered a proof for Fermats Last Theorem. This was accepted by the mathematical community as being watertight.
- There are no whole number solutions to Equation (1).

The Prisoner of Bender

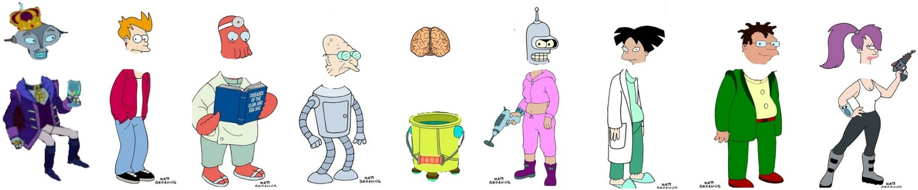
- In the Prisoner of Benda, the Professor and Amy have swap bodies.
- Once two bodies switch minds, they can never switch back.
- Maybe if they introduce another charecter they can play a little mental musical chairs.
- However, adding one extra body isn't enough to get everyone back.



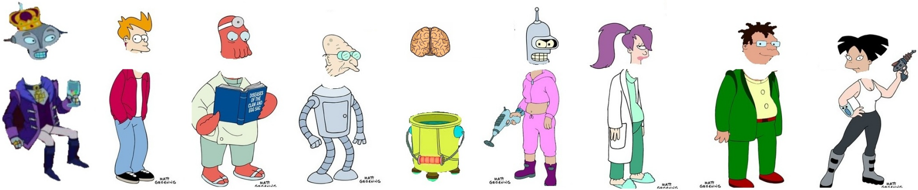

DISEASES OF THE CLAW AND EGG SAC



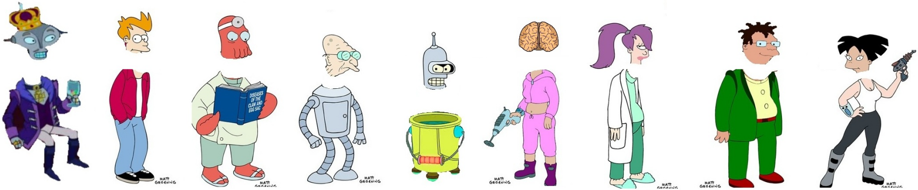
$(a\ p)$



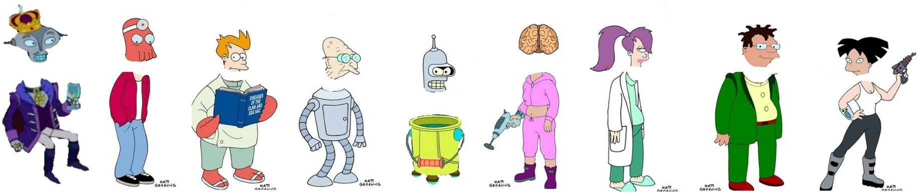
$(a\ p)(a\ b)$



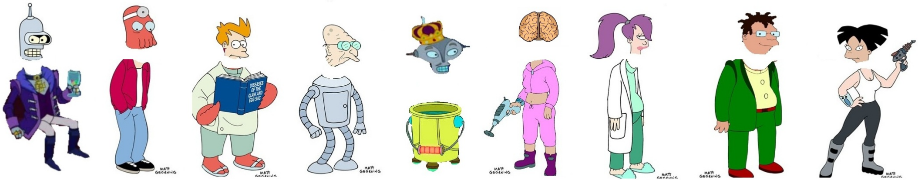
$(a\ p)(a\ b)(p\ l)$



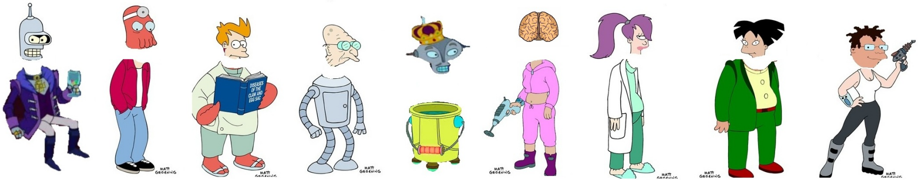
$(a\ p)(a\ b)(p\ l)(a\ w)$



$(a\ p)(a\ b)(p\ l)(a\ w)(f\ z)$



$(a\ p)(a\ b)(p\ l)(a\ w)(f\ z)(e\ w)$



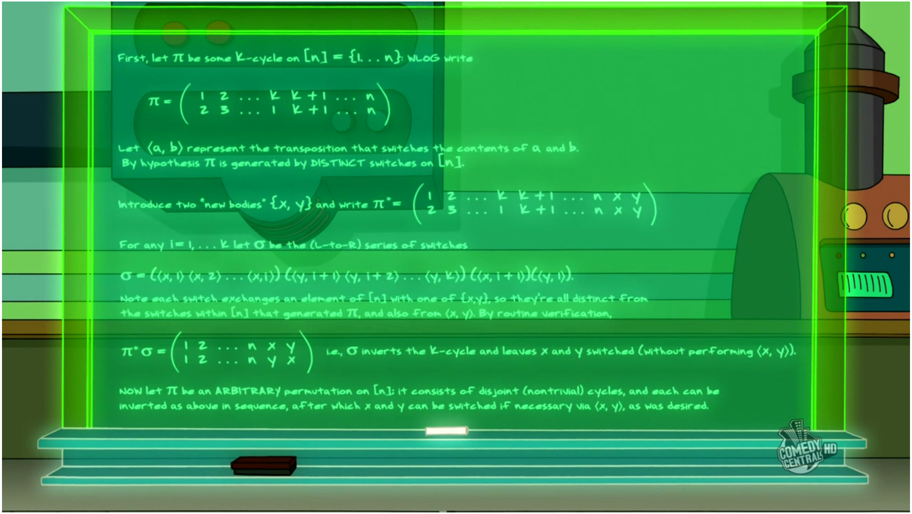
$(a\ p)(a\ b)(p\ l)(a\ w)(f\ z)(e\ w)(h\ l)$

Ken Keeler

Ken Keeler

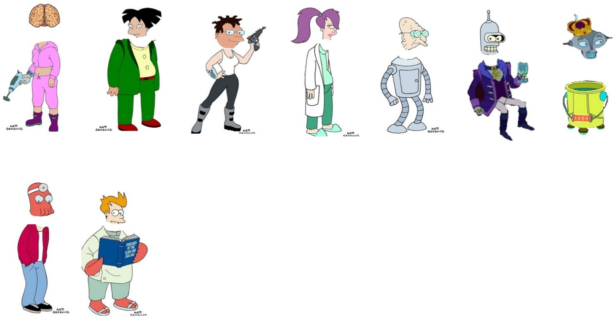
- To undo the mixing of minds, Ken Keeler used group theory in what must be one of the most mathematical resolutions to a plot on T.V - ever!

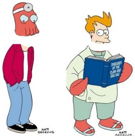
Keeler's Theorem



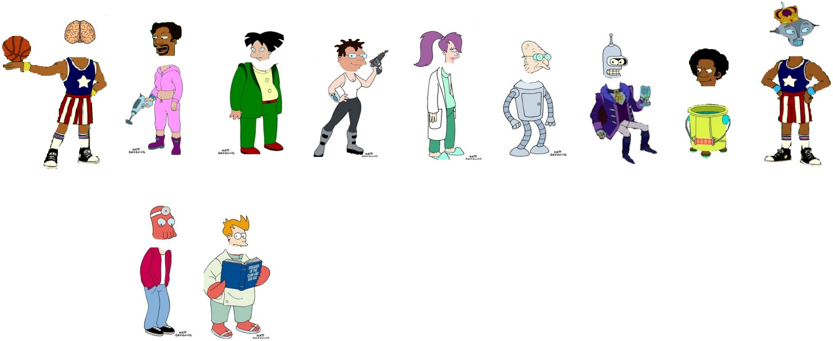
Keeler's Theorem (in plain English)

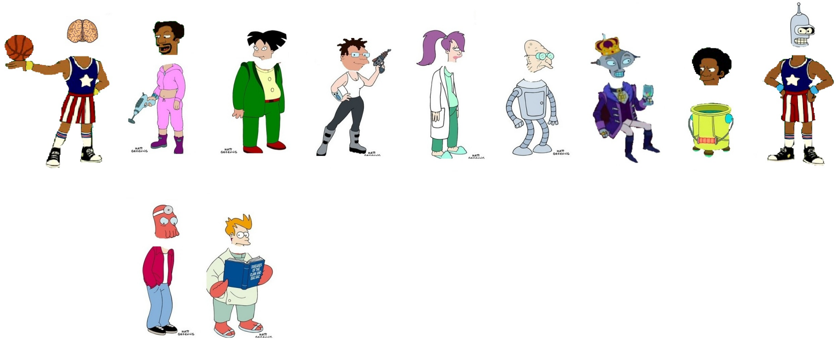
1. Have everybody who's messed up arrange themselves in circles.
2. Go get two "fresh" people. Let's call them Helper A and Helper B.
3. Fix the circles one by one as follows:
    - Start each time with Helper A and Helper B's minds in either their own or each other's bodies
    - Pick any circle of messed-up people you like and unwrap it into a line with whoever you like at the front
    - Swap the mind at the front of the line into Helper A's body
    - From back to front, have everybody in the line swap minds with Helper B's body in turn. (This moves each mind in the line, apart from the front one, forward into the right body)
    - Swap the mind in Helper A's body back where it belongs, into the body at the back of the line. Now the circle/line has been completely fixed.
4. After all the circles have been fixed, mind-swap the two Helpers if necessary.

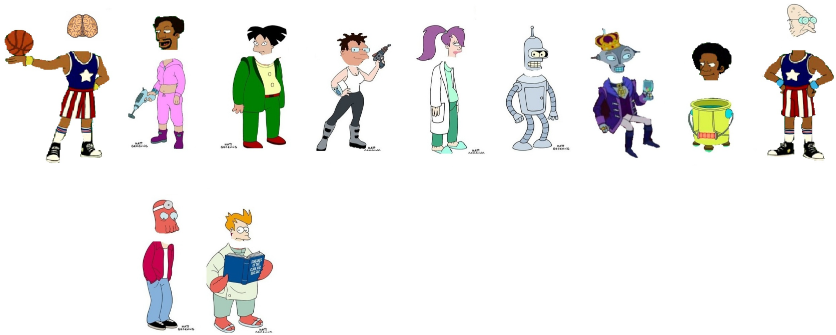


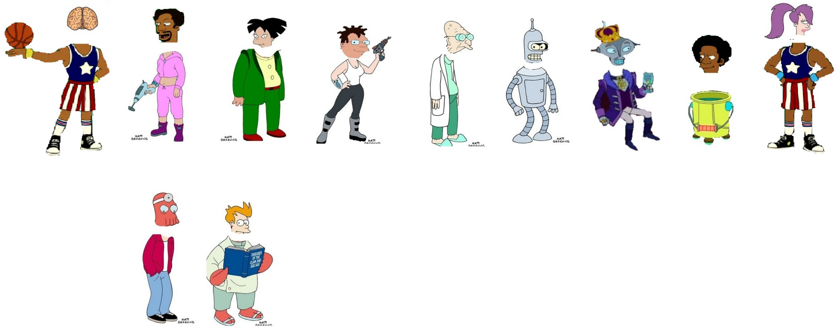

DISEASES OF THE CLAW AND EGG SAC

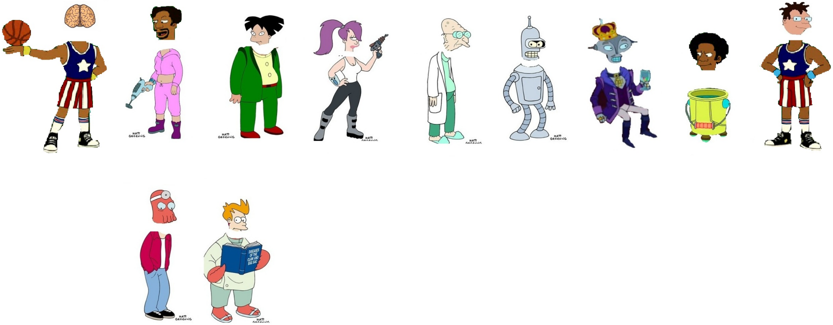

DISEASES OF THE CLAW AND EGG SAC

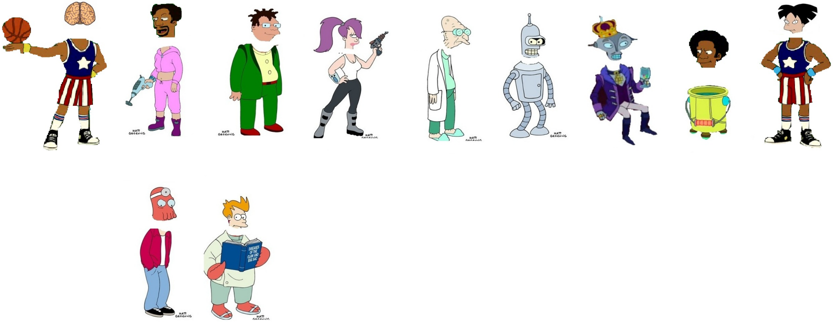


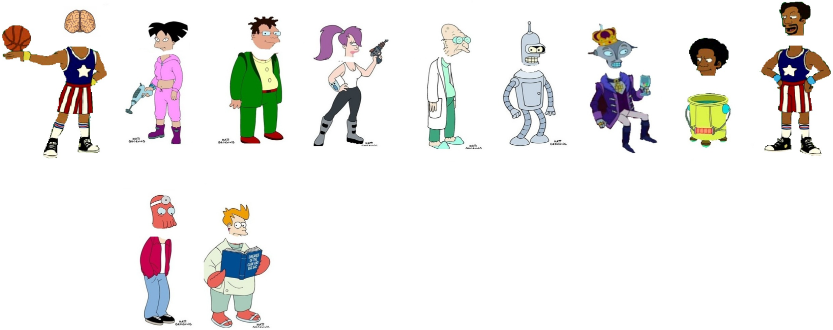


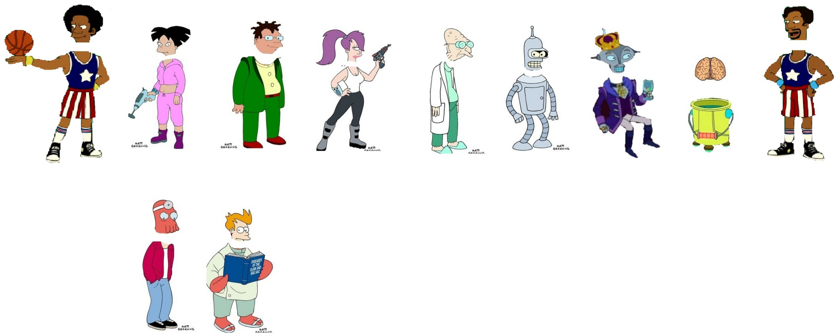

DISEASES OF THE CLAW AND EGG SAC


DISEASES OF THE CLAW AND EGG SAC










DISEASES OF THE CLAW AND EGG SAC


DISEASES OF THE CLAW AND EGG SAC


DISEASES OF THE CLAW AND EGG SAC