

27/30

- 1) Given any finite collection of primes $N = p_1 p_2 p_3 \dots p_i$
 - Now consider $N+1$
 consider

Case 1

$N+1$ is prime. It is a new prime because it is larger than p_i

Case 2

$N+1$ is composite. It is a new prime because it divides $N+1$ & N . and divides $(N+1)-N=1$. ✓

Primes can't divide by 1

∴ the collection can not be complete, so implies there are infinite many primes

3) $x^2 + 8x = 65$

Steps

A) x^2 represents x^2

B) $8x = 4x + 4x$ ✓

C) $x^2 + 8x$

D) Begs to be completed

not to scale $x^2 + 8x + 16$

E) Equate

$x^2 + 8x + 16 = 65 + 16$ (-1)

F) Balance the equation

$x^2 + 8x + 16 = 65 + 16$ ✓

$(x+4)^2 = 81$

G) ~~re~~ rewrite $(x+4)^2 = 81$ ✓

$x^2 + 8x + 16 = 81$
 $-16 -16$
 $x^2 + 8x = 65$

$x+4=9$
 $-4-4$
 $x=5$

LOL what am I doing
 He did not do ~~plus~~ plus or minus

Proof by contradiction
Assume that $\sqrt{2}$ is rational
 $\sqrt{2} = \frac{b}{c}$ where b & c are non-zero

$$\sqrt{2}c = b \quad \xrightarrow{\text{square both sides}} \quad \sqrt{2}c^2 = b^2$$

$$2 \mid b^2$$

$$2 \mid b$$

$b = 2k$ integer

$$\sqrt{2}c^2 = 4k^2$$

$$2 \mid c^2 \text{ why?}$$

$$2 \mid c$$

Contradiction 2 divides
both b & c

-1

Staple area

Good. But could have discussed a bit more.

Matthew Mendoza

Lack of sleep I guess

4) ~~Archimedes known for his proof based and systematic Math text "Elements"~~

9/10

In Euclid

Archimedes born in the 3rd century BCE. was a ~~greek~~ Greek polymath (i.e. in addition to Mathematics he ~~is known~~ made advancements in other areas of interest like physics, astronomy, and is an inventor).

His inventions include, the self named, Archimedes screw that is still used today to the theoretical "Death ray" and has been proven to be a myth on Mythbusters.

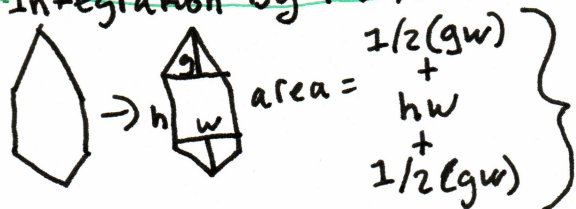
Although other earlier Greek mathematicians like Euclid used/have known of the Method of exhaustion...

Archimedes mastered the ~~fact~~ Method by applying it to

- circles, spheres, spirals
- surface areas

Method of Exhaustion

Integration by Parts



same concept by extension please imagine
↓ it's a 16-gon



The method of Exhaustion is an integration by parts as n (the number of sides) approaches infinity and so an early development of the calculus we know today