Observations on Factoring Using the GNFS

How Do I Factor - GNFS

1. Polynomial Selection
2. Sieving
3. Combine

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2. Such that $b^d \cdot f(a/b)$ & $b^e \cdot g(a/b)$ factor 'prettily' (are smooth)
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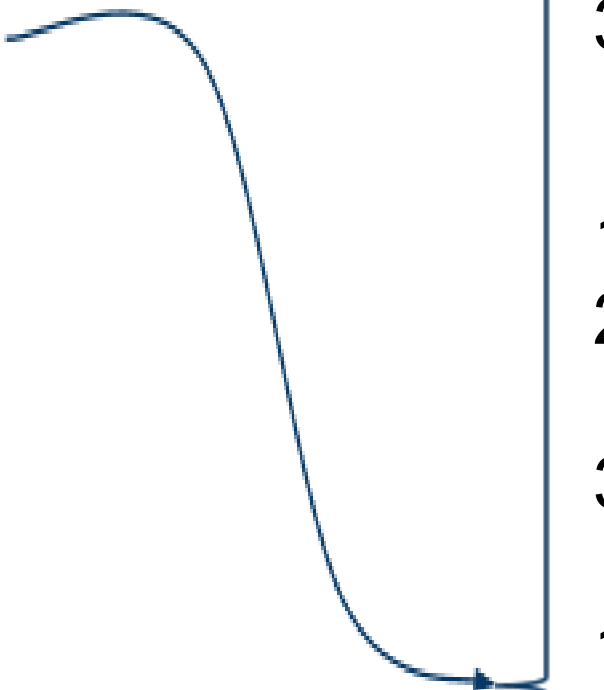

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1. Filter Relations & Build Matrix
2. Linear Algebra using Lanczos
3. "Square Root Phase"

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Slow & Unparallelizable

512 Bit ~8 Core-Days

768 Bit ~155 Core-Years*

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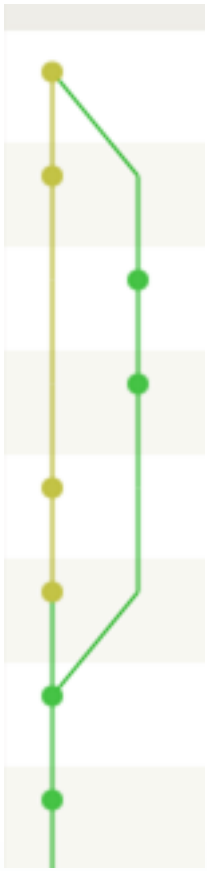
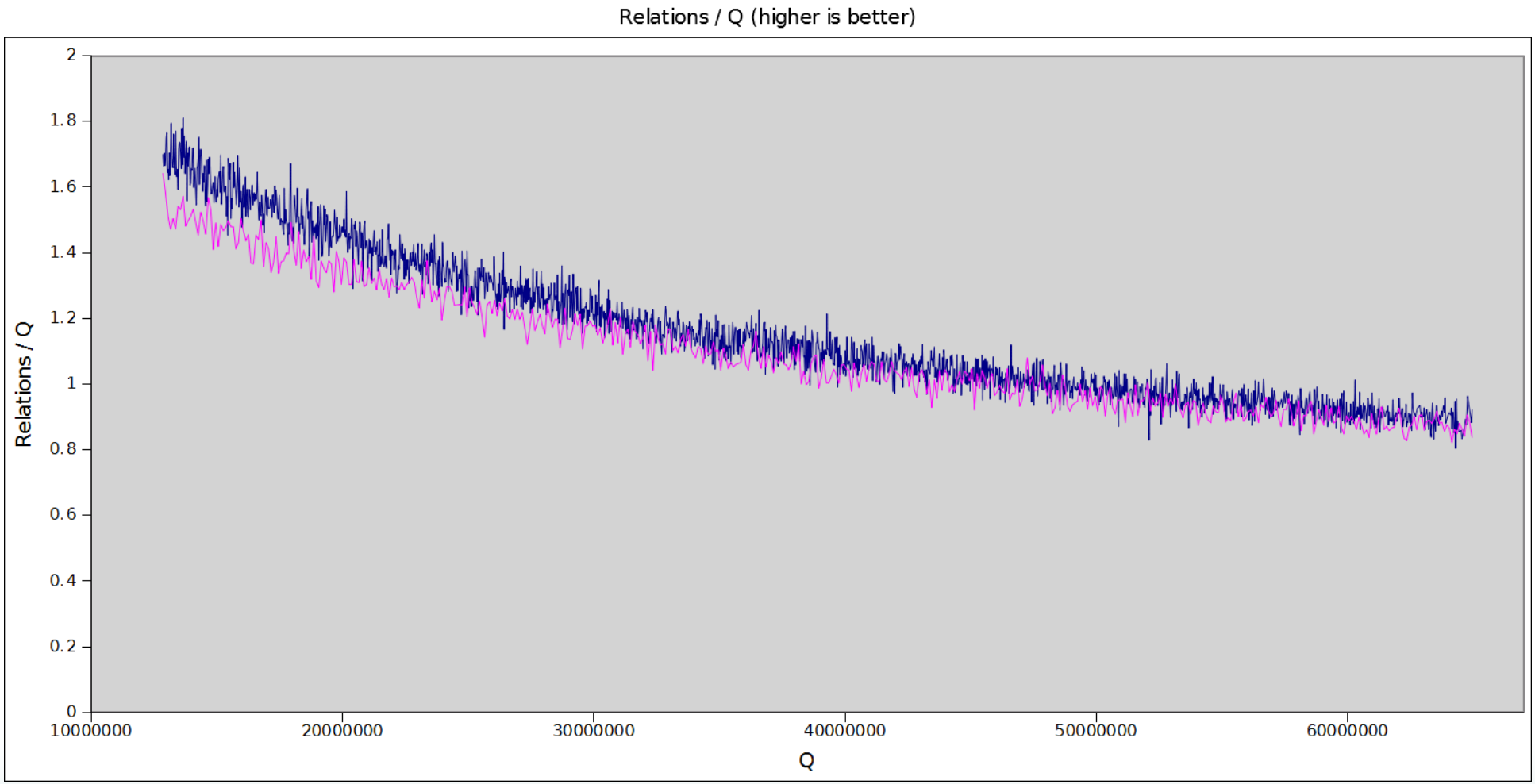
Some Details on Factoring



- Polynomial Selection
- Siever Comparisons
- Oversieving

Misconceptions about Polynomials



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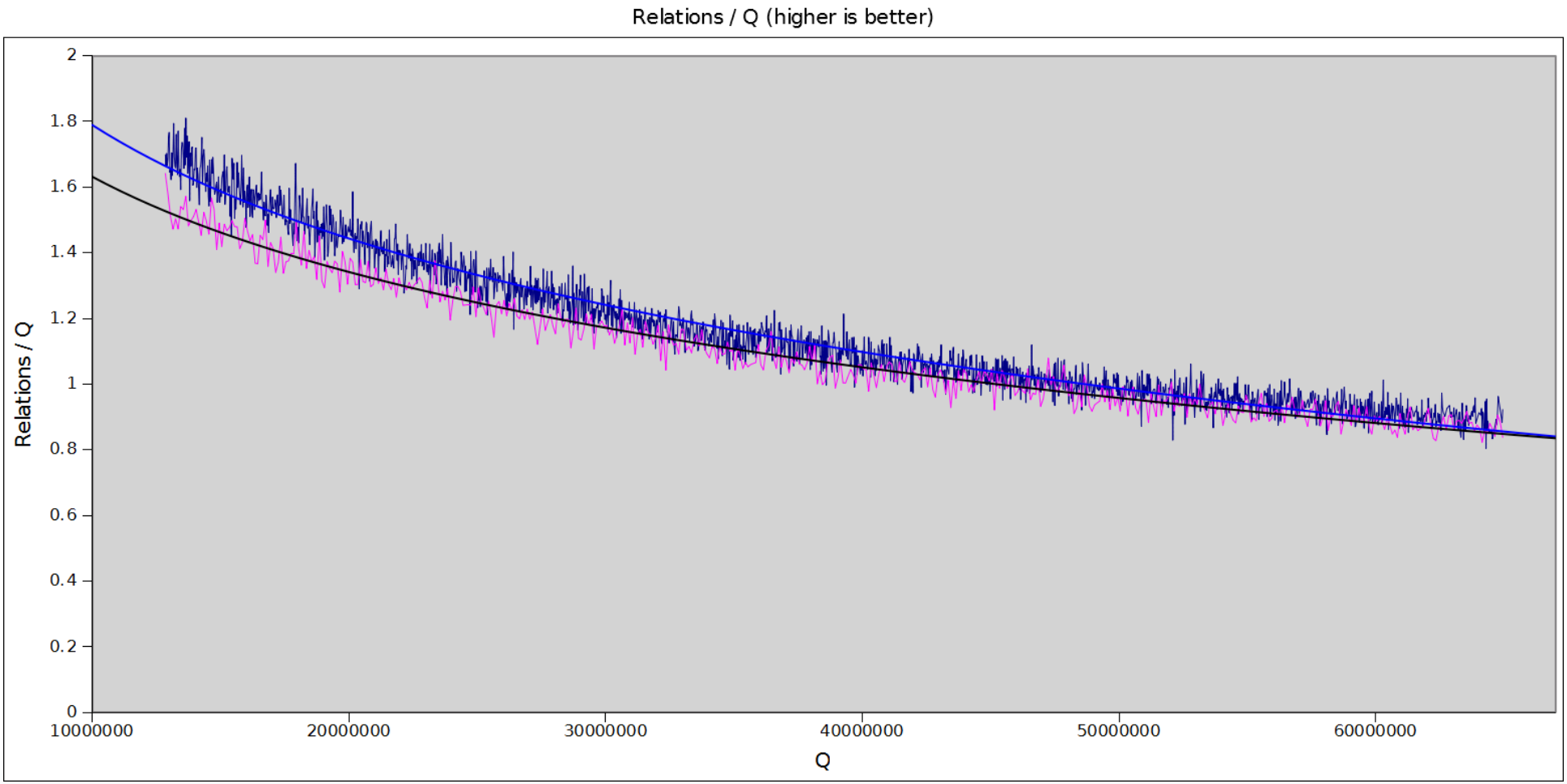

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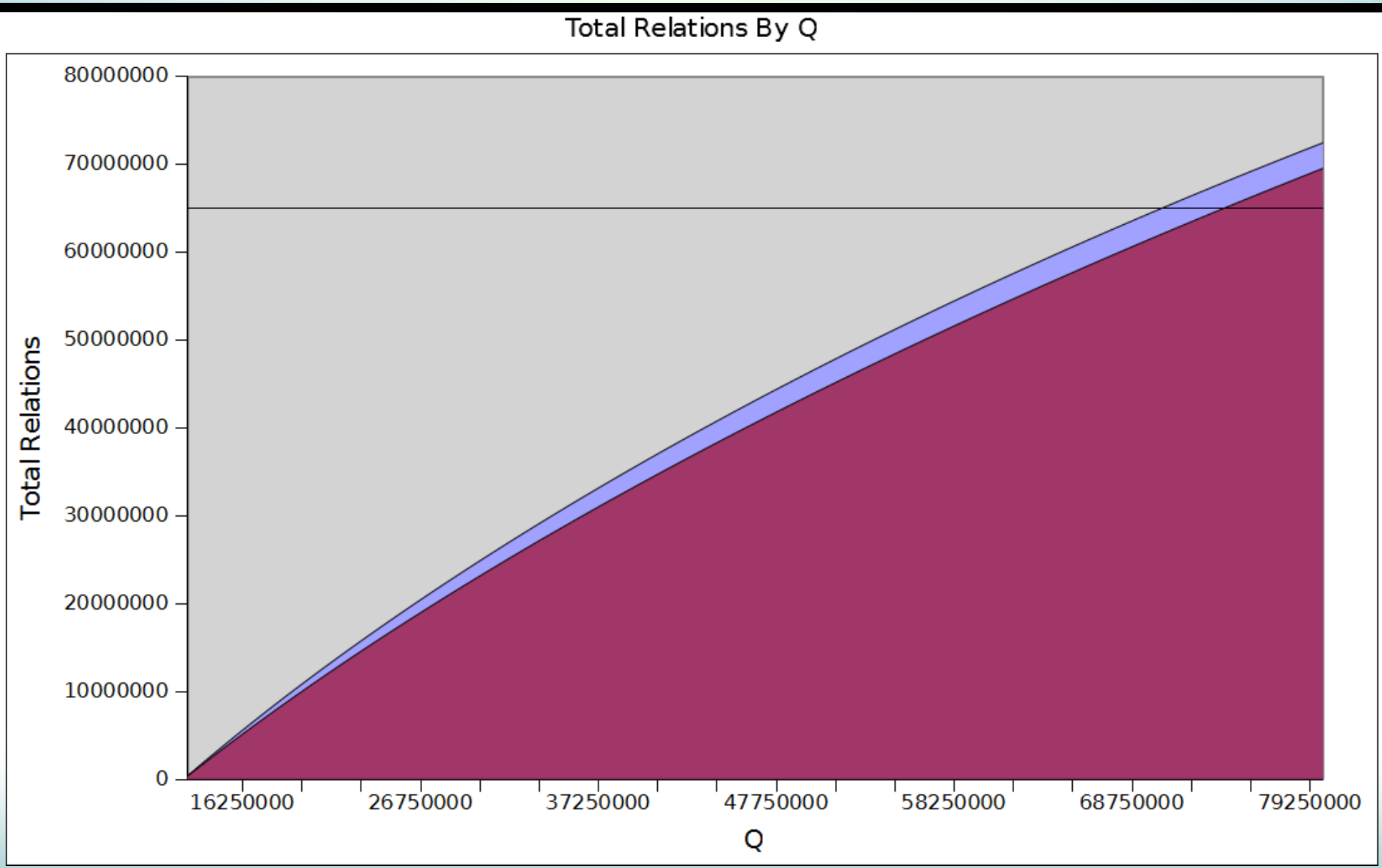

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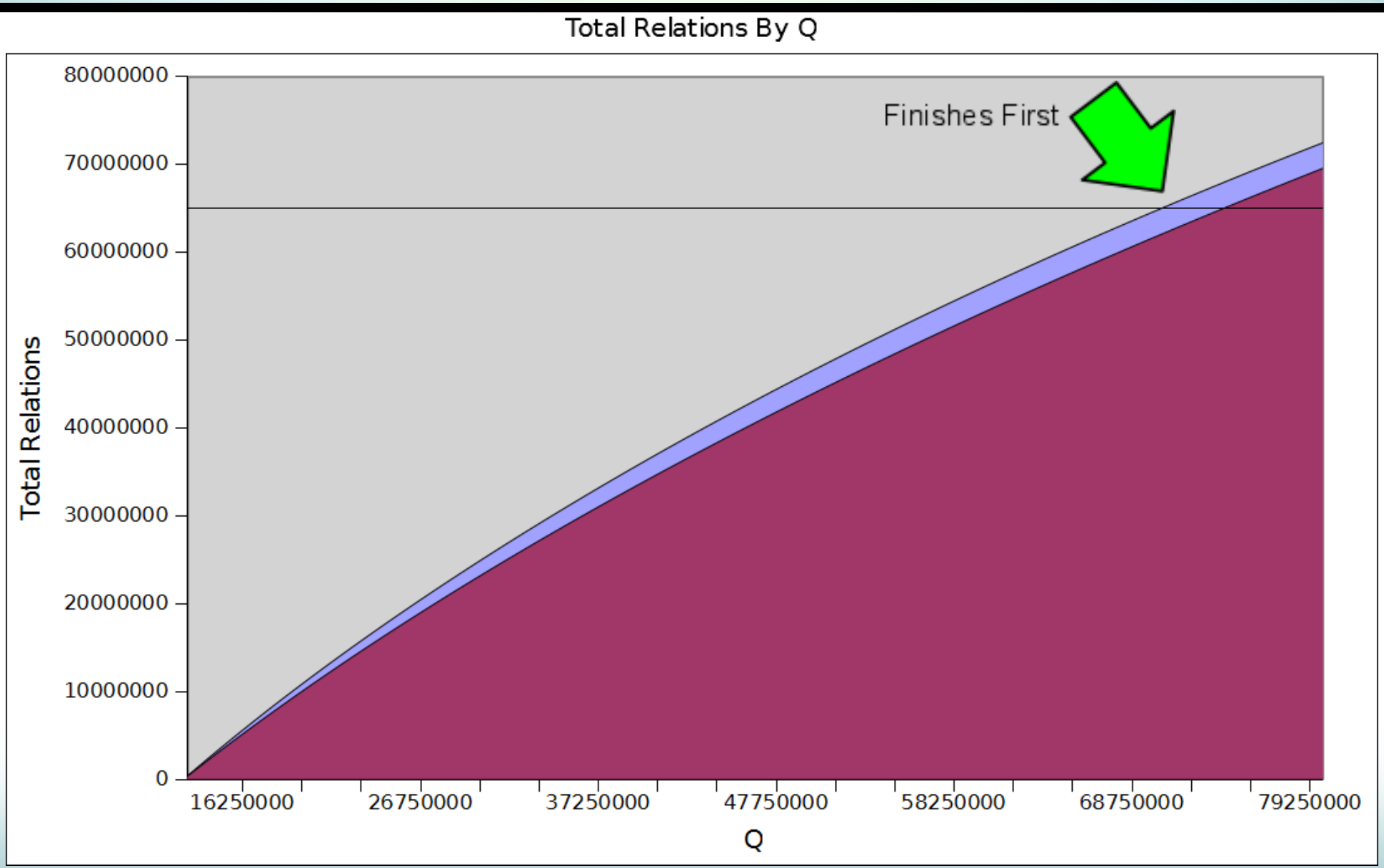

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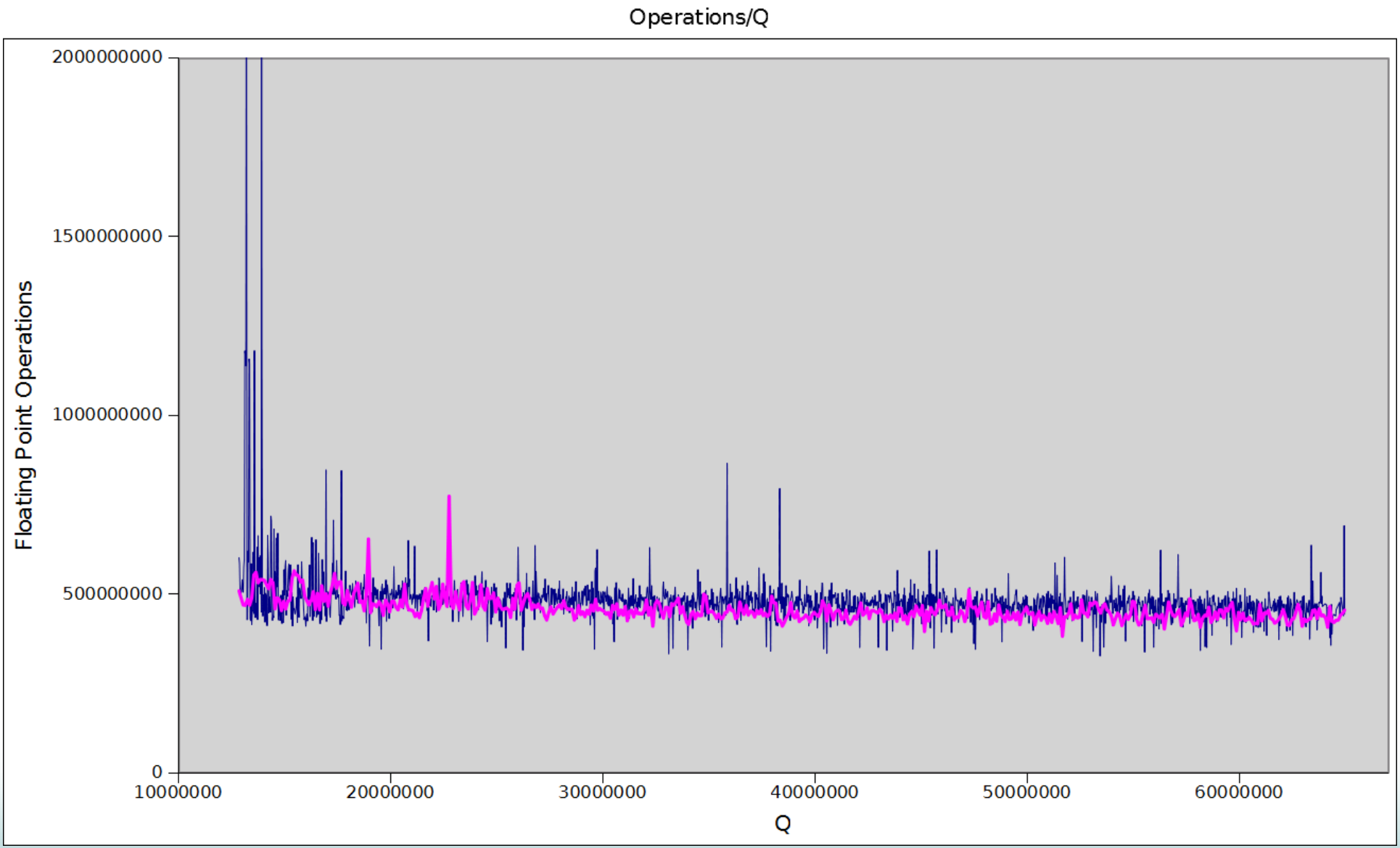

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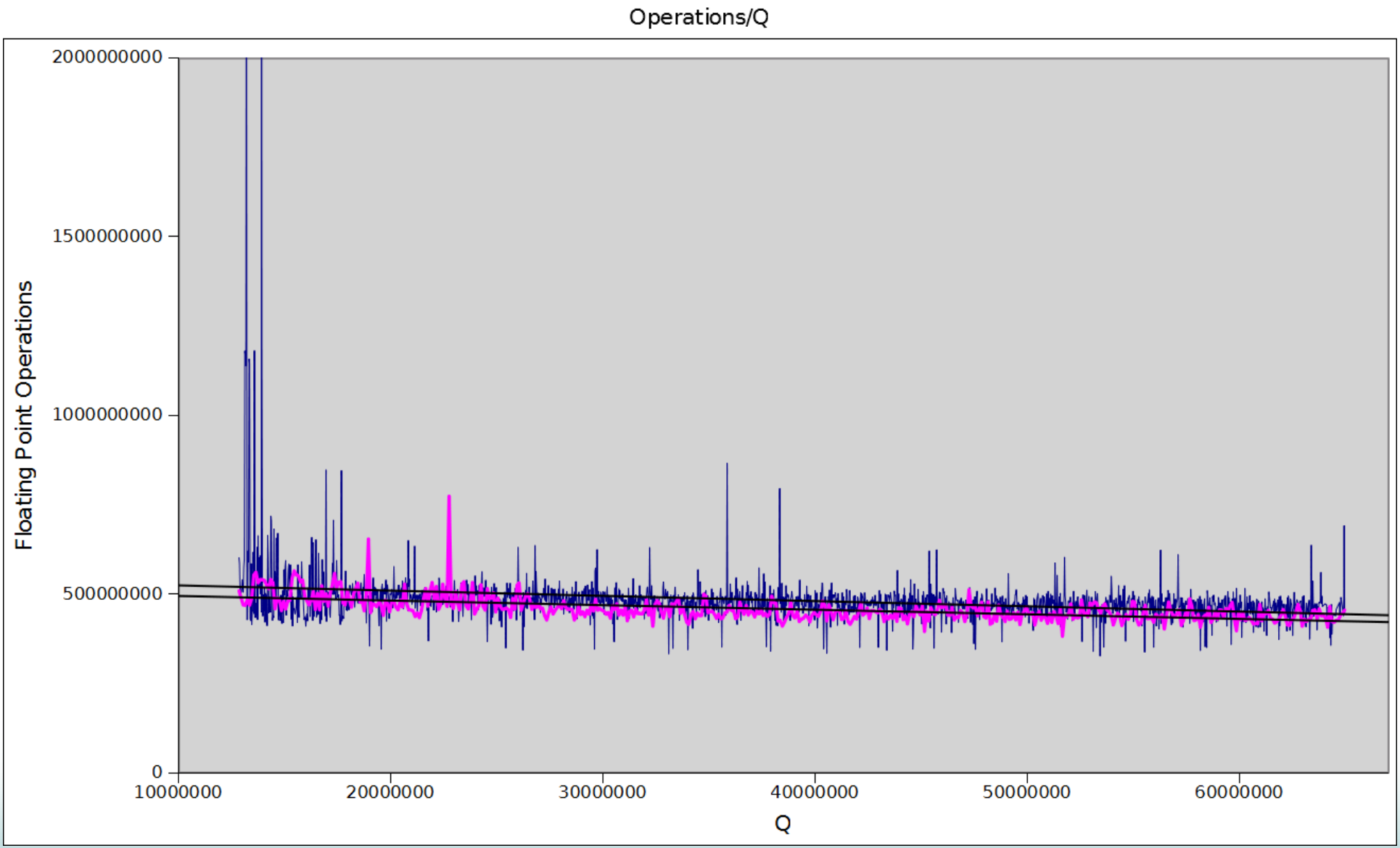

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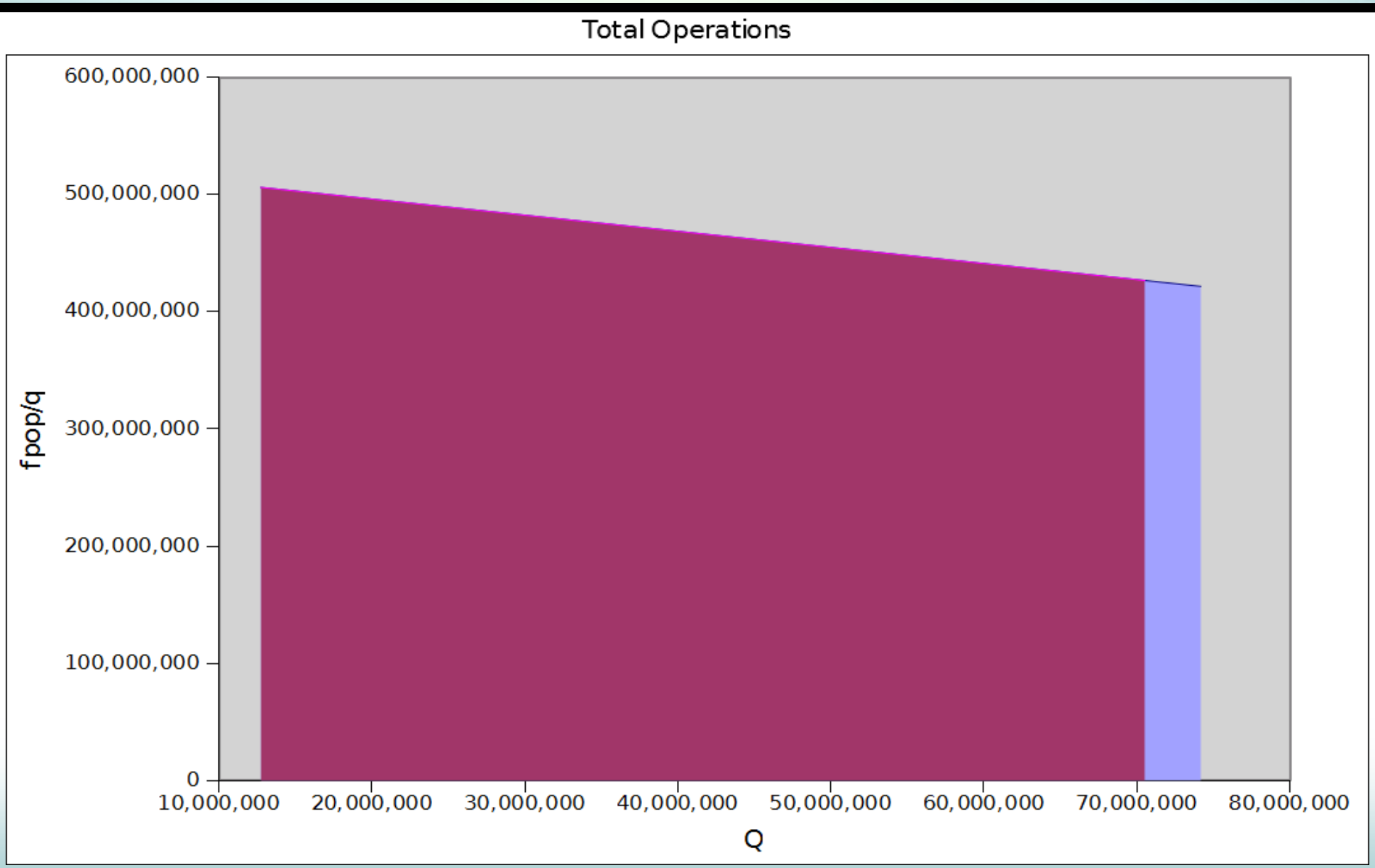

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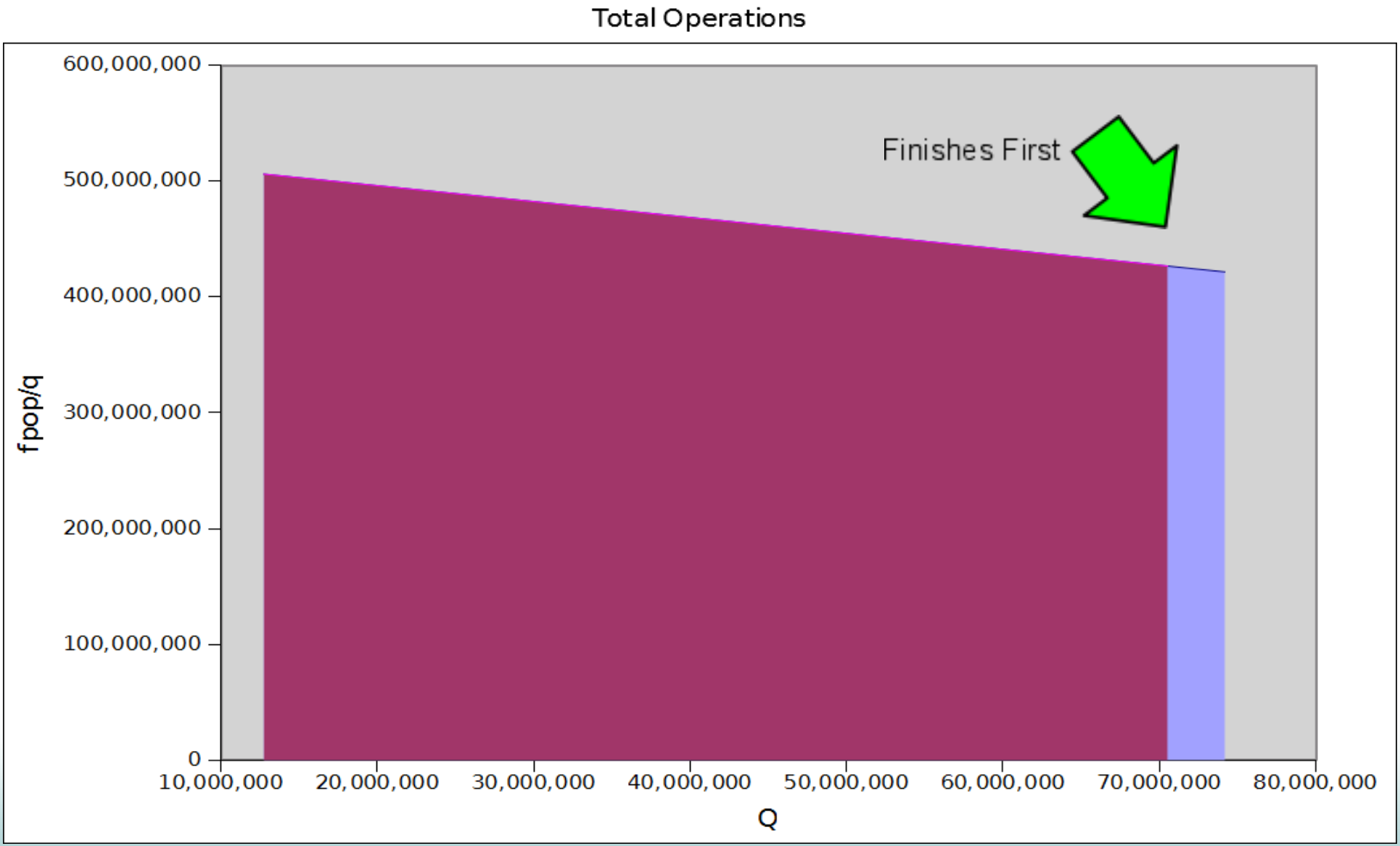

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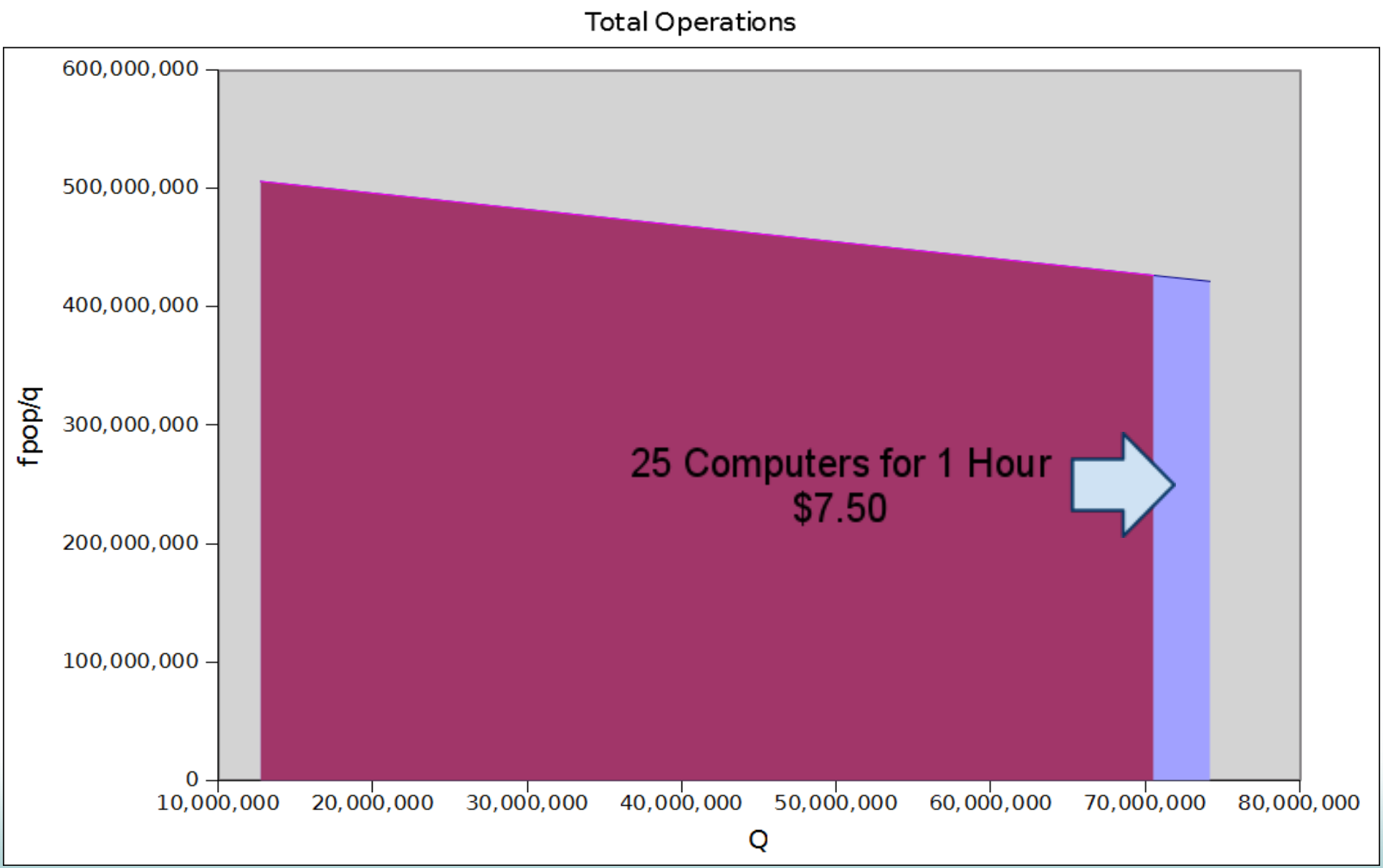
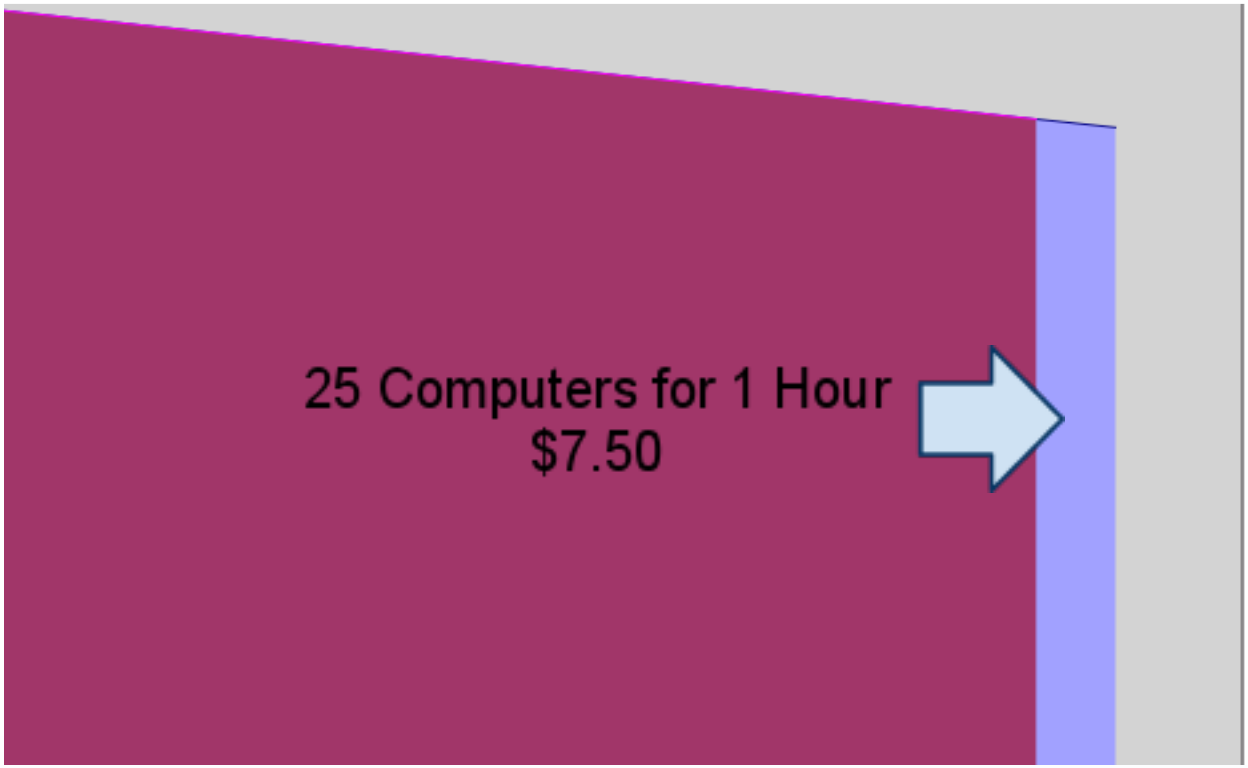


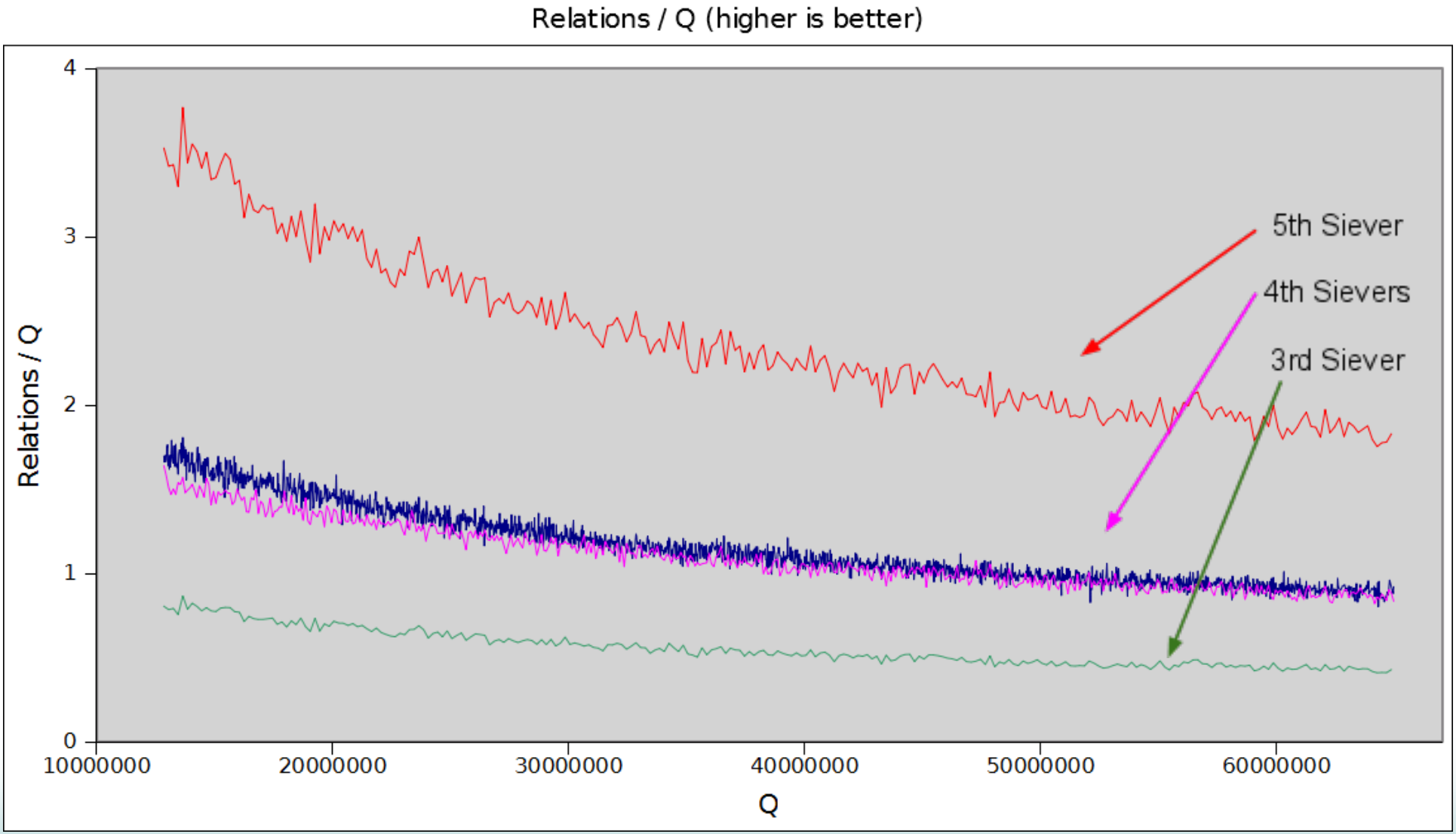
Misconceptions about Polynomials

If time is more valuable to you than (not much) money it is in your best interest to take the first polynomial you get and sieve with that, rather than doing another poly-selection run.

(this advice is only for 512-bit semiprimes.)



Siever Comparisons



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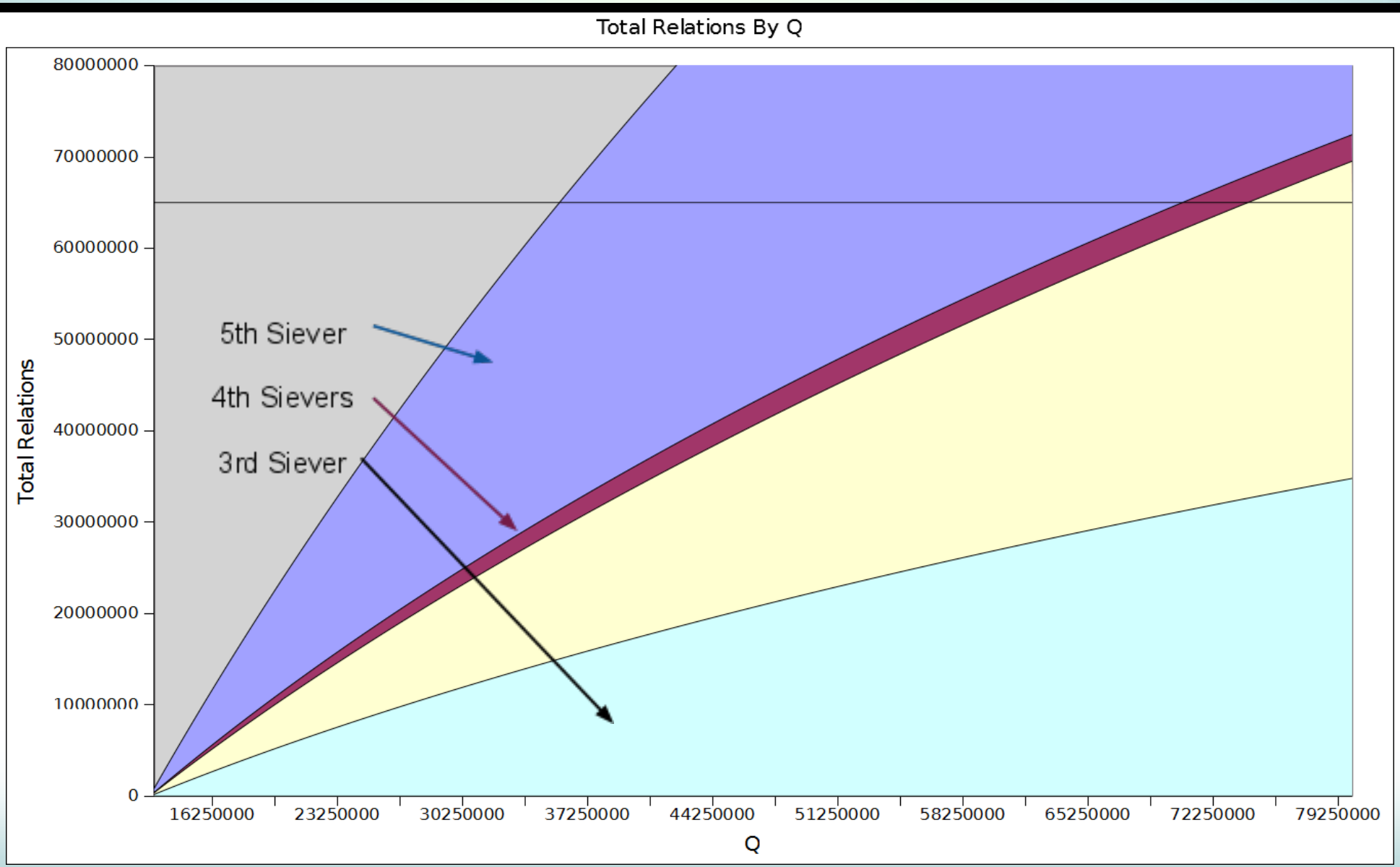

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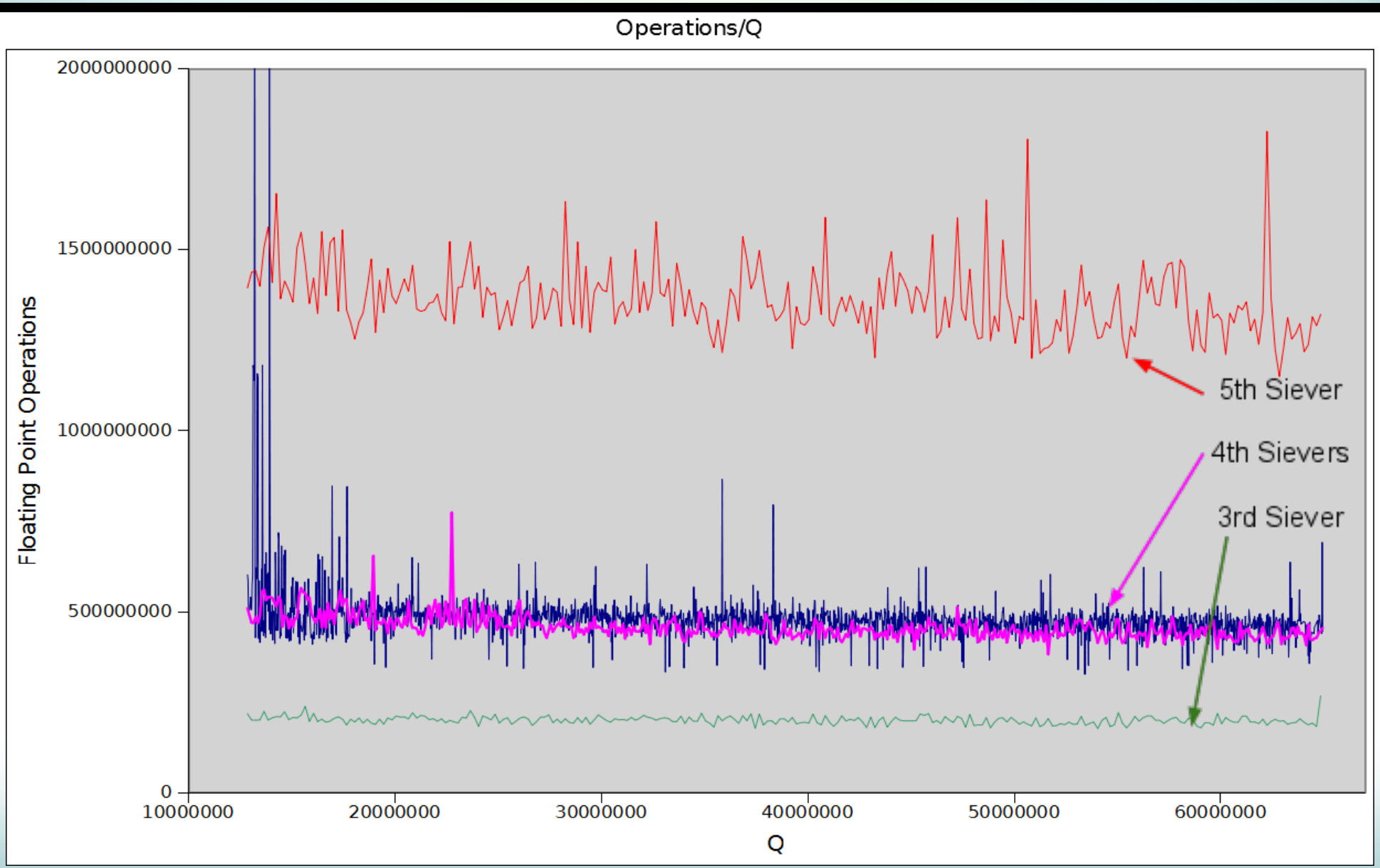

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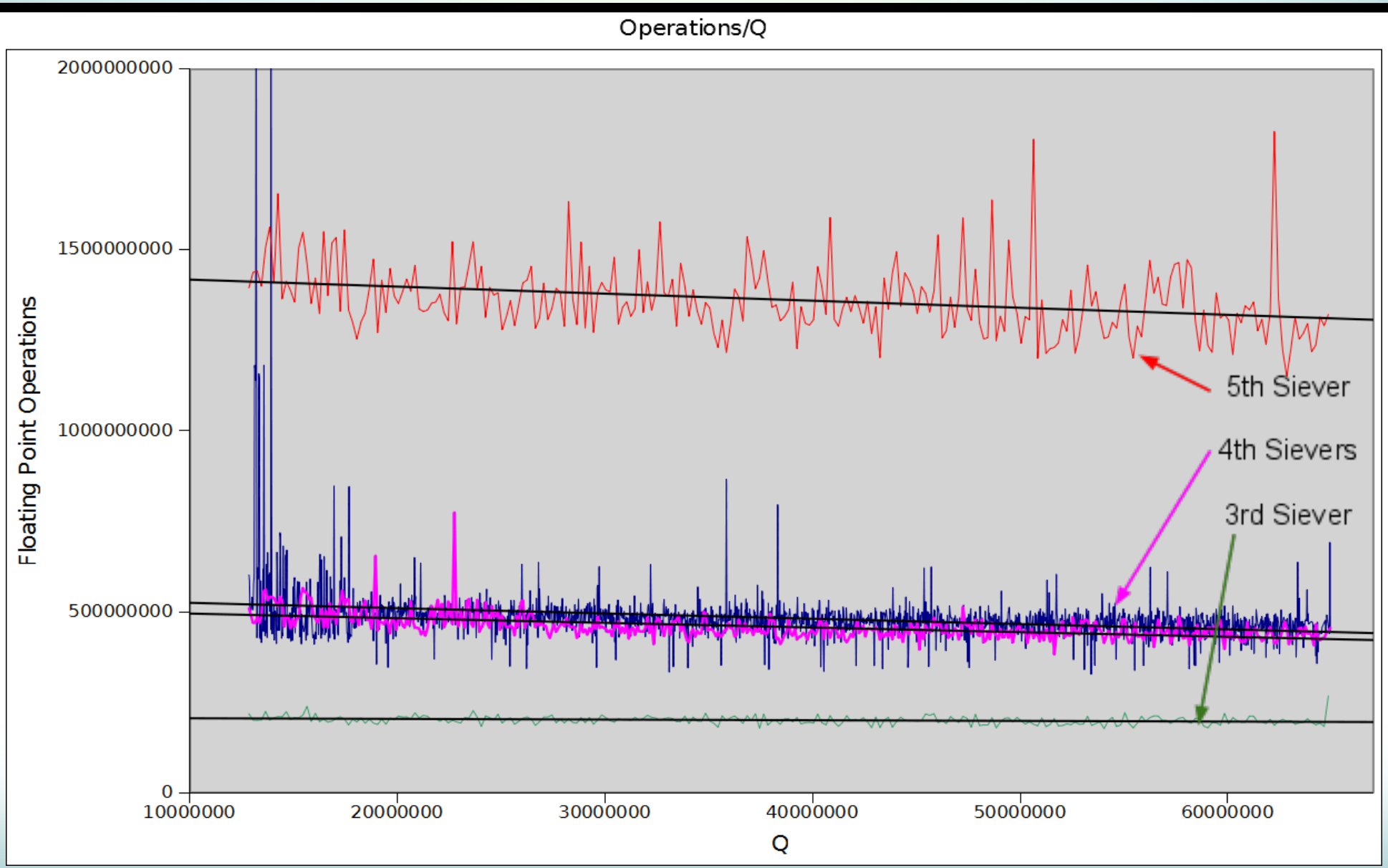

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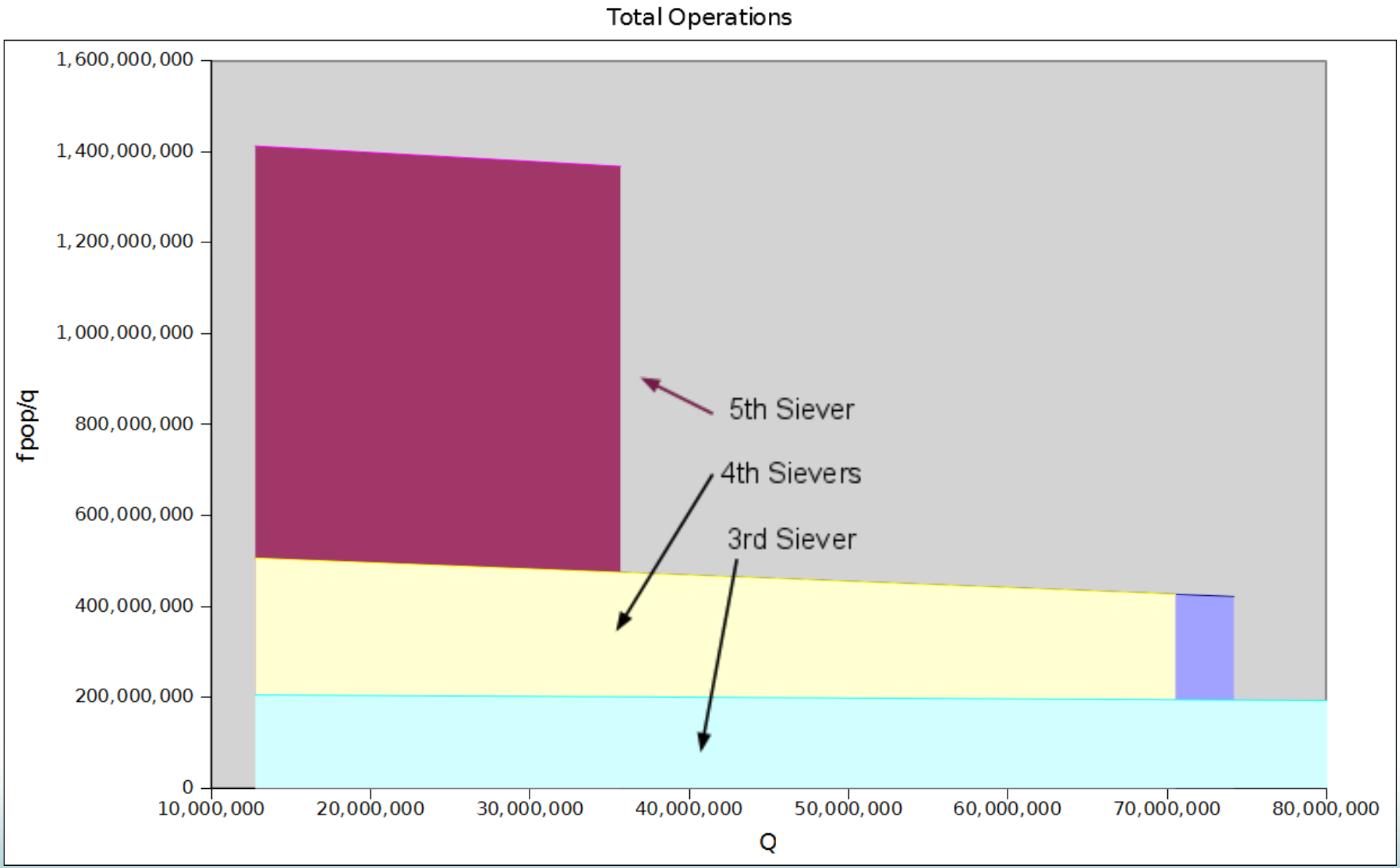

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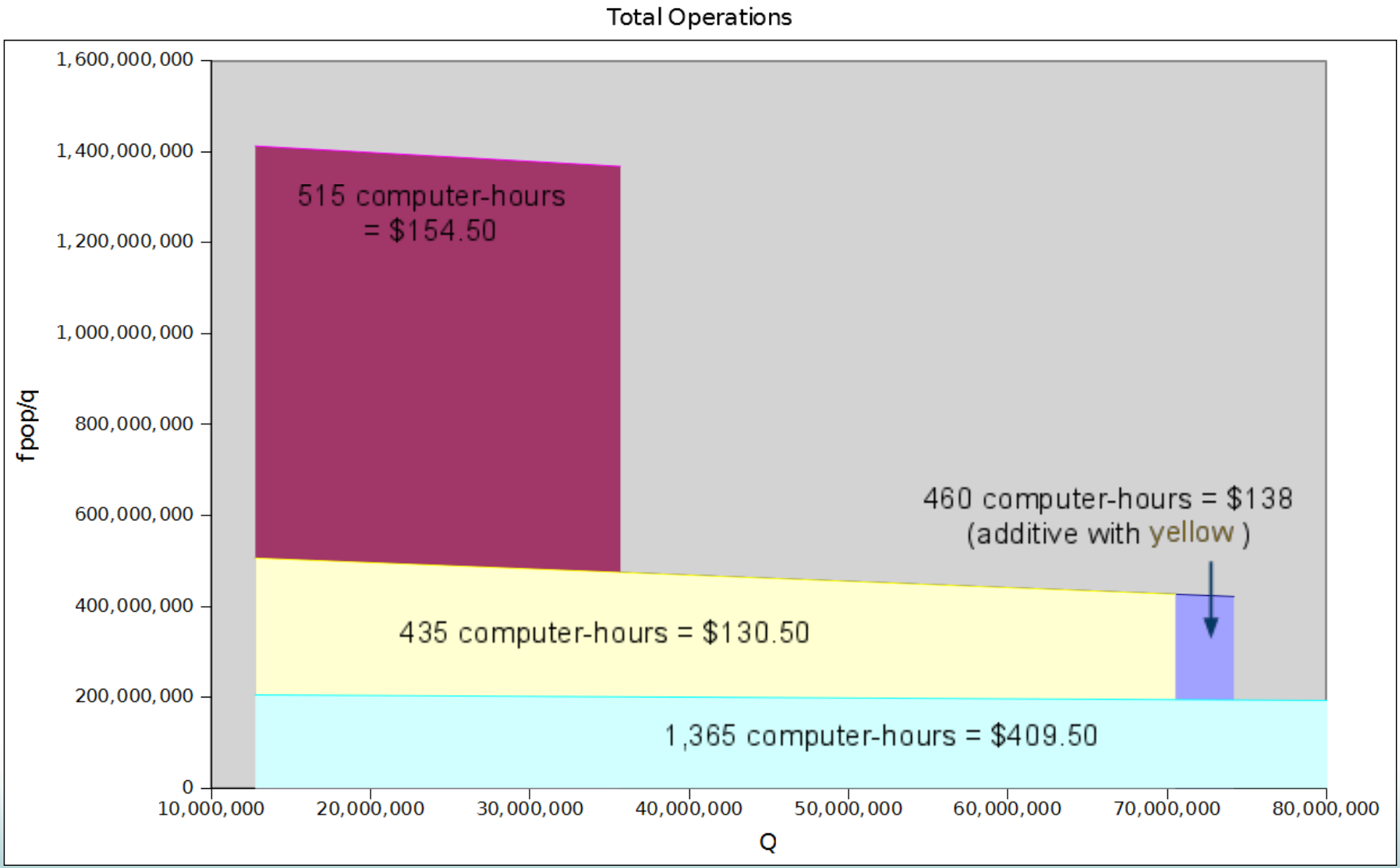
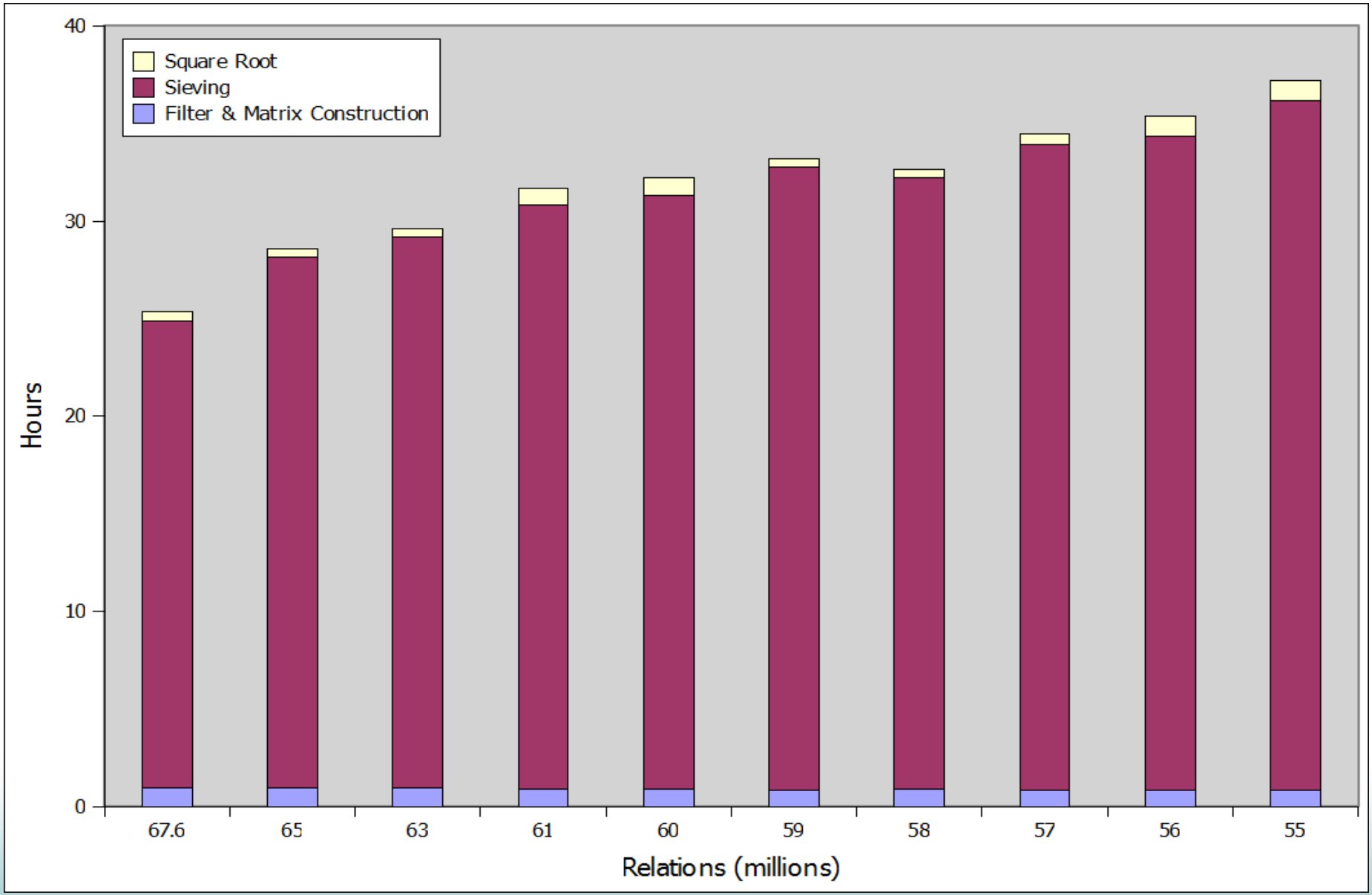


Oversieving



Obligatory Ending Slide

Fin

Thanks:

- GDS
- NYSec
- MersenneForum & jasonp

Tom Ritter
http://ritter.vg
(encrypted mail preferred)

Big Ups To:

- jasonp

http://www.gdssecurity.com/
https://github.com/GDSSecurity/cloud-and-control