On the Chalkdust Crossnumber,
straight lines,
and projective geometry

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THE SPATIALS

Too much writing and the font’s poor
You’ve done too much, too much C1

Consider a line of the form:

\[ ax + by + c = 0 \]

... and notice:

(a, b, c) looks a lot like a vector.
Abstract Jungle

• Natural question:
  – Given line \( ax + by + c = 0 \)
  – and line \( Ax + By + C = 0 \)
  – Is there a simple link between vectors \((a, b, c), (A, B, C)\) and the point where the lines cross?
A message to you, 2D

• Proof by MathsJam.

• IT’S ONLY THE CROSS PRODUCT!
  – (scaled so the z-coordinate is 1)
It’s working for the rat race

- Zeke scampers at 10m/s
- Monty scampers at 8m/s
- Zeke gives Monty a 10 metre head start
- Where does Zeke catch up with Monty?

\[
x - 10t = 0
\]
\[
x - 8t - 10 = 0
\]
\[
(1, -10, 0) \times (1, -8, -10) = (100, 10, 2)
\]
Scaled: (50, 5, 1)

Zeke catches up 50 metres away after 5 seconds.
You’re wondering now
What to do
Now you know this is the end

- How about the line through two points?
- How about lines through the origin?
- Why does it work?
Enjoy yourself

It’s later than you think