

Risp 10: Teacher Notes

Suggested use: to consolidate/revise ideas about anything!

*Skills included: lines in co-ordinate geometry
quadratic equations
anything you like*

The usefulness of a Venn diagram as a risp has already been mentioned (see Risp 4: Periodic Functions). I revisit the subject because their penetrating nature has impressed itself upon me more and more recently. To be able to fill in an eight-region diagram shows a really deep understanding of the distinctions that a good student has to be able to make, while the weaker student finds being faced with a picture such as this much less threatening than a page of exercises.

"I can't think of a way to start..."

On the quadratic equation diagram, let's say...

"Just write down any quadratic equation, any at all."

Even the least confident student should be able to manage this...

"Now, where do you think it goes?"

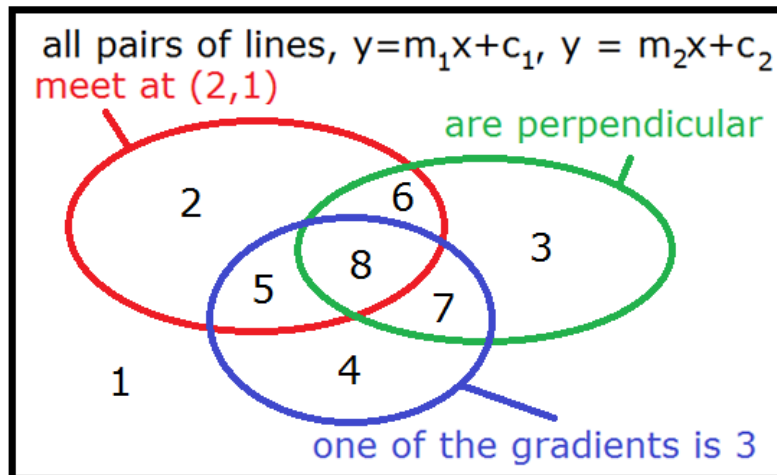
Once again, the fact that the student has thought up their own equation gives them a motivation to place it properly. And it must go somewhere! They must have written down a correct answer, if only they can correctly divine the nature of its correctness.

I reflect too on how easy this risp is for the teacher. No photocopying, no instructions to decipher, no cutting up; just draw a box and three circles on the board, with three properties, and you are away. My feeling is that risps that do not sympathise with the realities of a teacher's existence will never get used. I sometimes trial new materials for others, and my heart sinks when I see another slab of dense documentation flopping through the letterbox. Materials for the classroom should be completely intuitive, virtually running themselves. Sometimes those who write these materials have left the classroom more or less gratefully, and their memories seem to be remarkably short over what it actually feels like.

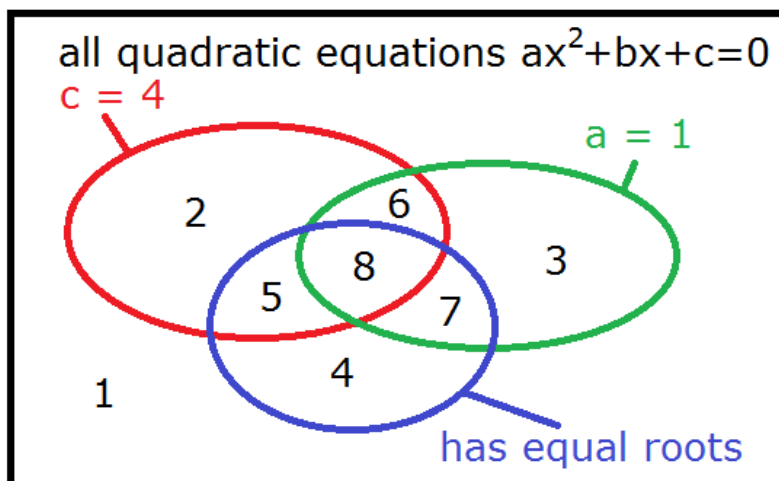
There is sometimes too (only sometimes!) a feeling on the part of some writers that you should deliver the lesson in exactly the way that they imagined it. With these materials the reverse is true: I invite you to customise, customise, customise. I offer no party line that I ask you to toe. I hope you will improve on my ideas, and I look forward to enjoying such improvements. I hope that I wave goodbye to my risps when I publish them as if they are teenagers leaving home.

As regards the particular Venn diagrams that make up this risp, possible solutions are below:

Risp 10: Teacher notes (continued)



1. $y = x$, $y = 2x$
2. $y = x - 1$, $y = 2x - 3$
3. $y = x$, $y = -x$
4. $y = 3x$, $y = x$
5. $y = 3x - 5$, $y = x - 1$
6. $y = x - 1$, $y = -x + 3$
7. $y = 3x$, $y = x/3$
8. $y = 3x - 5$, $y = -x/3 + 5/3$



1. $2x^2 + 3x - 1 = 0$
2. $2x^2 + 3x + 4 = 0$
3. $x^2 + 2x + 5 = 0$
4. $(2x - 1)^2 = 0$
5. $(3x - 2)^2 = 0$
6. $x^2 + 2x + 4 = 0$
7. $(x - 3)^2 = 0$
8. $(x - 2)^2 = 0$

Risp 10: Teacher notes (continued)

Ideas for other eight-region Venn diagrams?

Overall description: all circles $(x - a)^2 + (y - b)^2 = r^2$

Property 1: circle goes through (3, 0)

Property 2: circle goes through (-3, 0)

Property 3: $b = 4$

Overall description: all quadratic expressions $ax^2 + bx + c$

Property 1: remainder 1 when divided by $x + 1$

Property 2: $x - 1$ is a factor

Property 3: $x - 2$ is a factor

Overall description: all binary operations on the set of real numbers excluding 0

Property 1: commutative

Property 2: associative

Property 3: closed

And the list goes on...

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