Puzzles with hidden sines

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Gathering for Gardner 10

1 Ten cubic inches

Consider a rectangular piece of paper with area $52\frac{2}{3}$ square inches and a side of length τ inches. (A rectangle of this size is drawn on the next page.) Without tearing or overlapping, join the edges such that it forms a simple closed surface containing exactly 10 cubic inches.

2 Isosceles triangle hunting

An isosceles triangle has an angle τx and sides of distinct lengths y and z. Given that the values of x, y, and z are not enough information to construct the triangle, find x.

Discussion

The first puzzle has a very beautiful solution which will be difficult to stumble upon if you do not carefully consider the title and the dimensions of the paper to be folded. The second puzzle is not especially tricky, but I think it's neat that the problem itself doesn't contain any numbers.

Contact

If you would like the solutions or have feedback on these puzzles, please send an email to dlaw@dlaw.me.

This box has area $52\frac{2}{3}$ in^2 and a side of length τ in.