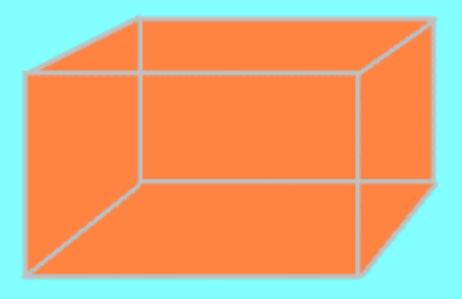
Risp 6: The Gold and Silver Cuboid

Put the equation $y = 8x^3 - px^2 + qx - r$ into your graph plotter.
Now adjust p, q and r using the Constant Controller.

Can you find positive values for p, q and r so that the equation $y = 0$ has three positive solutions a, b and c?

Note down p, q and r, and your values for a, b and c to 4sf.
Sketch the cuboid with sides 2a, 2b, and 2c.
Find V (= volume), S (= surface area) and E (= edge-length).

Can you find a connection between p, q and r and V, S and E?
Can you prove this will always work?



A cuboid uses exactly 10 cm of silver edging for its edges and exactly 3 cm^2 of gold paint to cover its surface area.

What is the maximum V can be,
and what are the sides of the cuboid in this case? (to 3sf)

What is the minimum V can be,
and what are the sides of the cuboid in this case? (to 3sf)

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