What can you see?
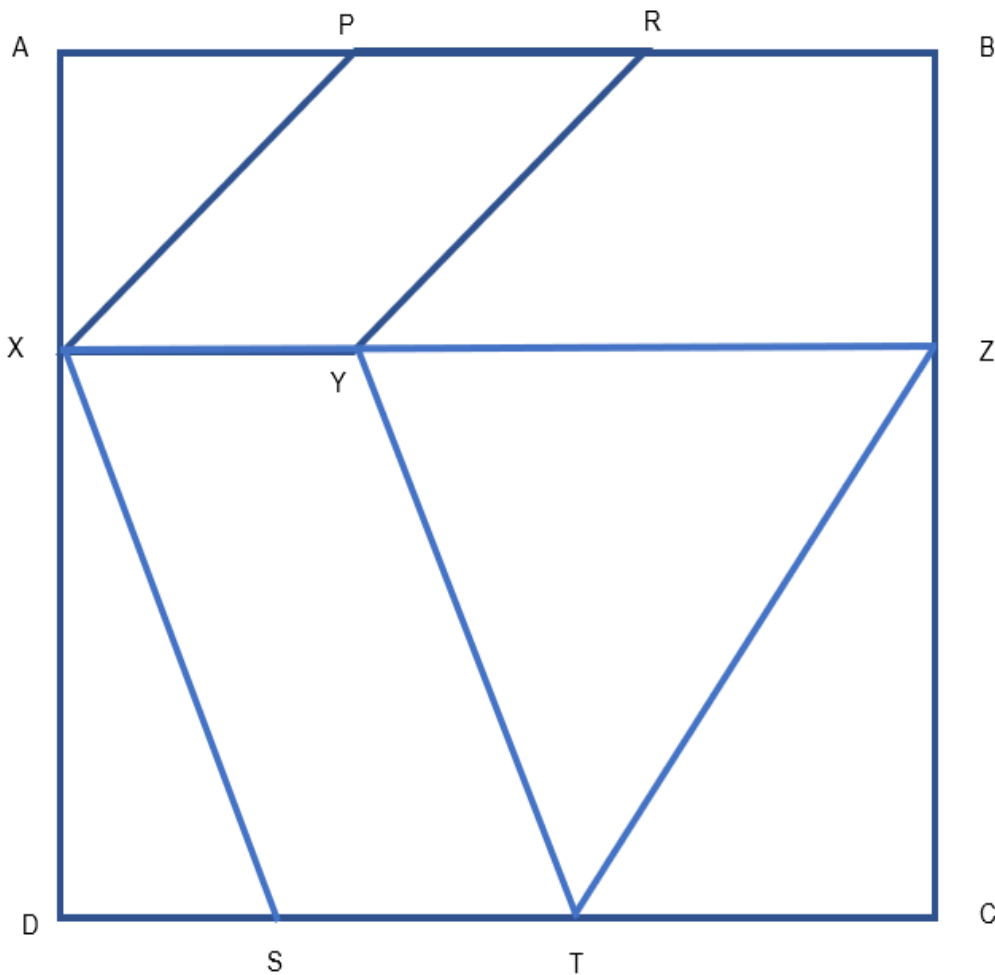
What do you already know?

ABCD is a square of area 144cm².   length of sides = 12 cm

- RYXP is parallelogram – RY ≠ PX, PR ≠ XY, AB ≠ XZ ≠ DC
- XS is parallel to YT - XYTS is a parallelogram
- Point Z divides length BC in the ratio 1:2 – BZ = 4cm, ZC = 8cm
- AP = PR = RB - they equal 4cm, XY = 4cm, YZ = 8cm, ST = 4cm

The area of DSX is $\frac{1}{12}$ of the whole square - So area = 12cm², XD = 8cm ∴ DS = 3cm and TC = 5cm

What shapes can you see? – Square, rectangles, isosceles right-angled triangle, right angled triangles, parallelograms, rhombi, pentagon

Does the information given help you to make more statements? - See above

Jack says the area of APX is 8cm² is he correct? Explain why. Yes, Jack is correct because AX = 4cm, XY = 4cm, so the area of APX = (4x4)/2 = 8cm²

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What else can you find?

- Lengths and Areas – PX can be found by Pythagoras √32 or 4√2, likewise XS = √73, ZT = √89. Areas of the individual shapes are 8cm², 16cm², 24cm² along the top and 12cm², 32cm², 32cm² and 20cm². They can then have numerous areas for the composite shapes
- Fractions and Ratios – Using the areas they can have fractions of the whole e.g. $\frac{1}{18}, \frac{1}{9}, \frac{1}{6}$, APX is half of PRYX etc. APX : PRYX : RSZY = 1 : 2 : 3etc
- Angles – PXA = APX = PXY = PRY = 45°, RPX = RYX =135°etc, ZTC ≈ 58° (Tan ZTC = 1.6) etc
- Generalisations of the connections – If you started without numeric values e.g. AP = x, AB would be 3x, the area of ABCD would be 9x², etc.

And now your turn

At GCSE you are expected to connect your knowledge of different topics together in order to solve problems or reason why. In the example above you were given six pieces of information which enabled you to find many more facts. Would it have been possible to give less information?

The diagrams below have no information this is now in your hands, choose either one.
What statements of information are you going to give in order for others to solve a particular problem you set or to find all the connections?