Solutions

Accept equivalent correct methods and supported interpretations. The marks check reasoning; they are not an official grade.

2.1 B – Apply (-y,x). A reflects in the horizontal axis; C rotates clockwise; D reflects in the vertical axis. None is the stated anticlockwise quarter-turn.

Correct response linked to the given case.

2.2 C – Average corresponding coordinates. A averages the y difference rather than y coordinates; B combines endpoints without averaging; D adds coordinates without halving.

Correct response linked to the given case.

2.3 -1/2 – The slopes multiply to -1.

Correct response linked to the given case.

2.4 False – They establish similarity; lengths may differ.

Correct response linked to the given case.

3.1 Rotate first to $(3, 2)$, then translate to $(7, 3)$. Translate first to $(6, -2)$, then rotate to $(2, 6)$. The endpoints differ, so transformation order matters.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence. Accurate conditions, checks or qualification.

3.2 $d = \sqrt{(5+1)^2 + (10-2)^2} = 10$. Midpoint $M = ((-1+5)/2, (2+10)/2) = (2, 6)$. Segment slope is $8/6 = 4/3$, so perpendicular slope is $-3/4$. The bisector is $y - 6 = -(3/4)(x - 2)$.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence. Accurate conditions, checks or qualification.

3.3 The triangles are similar by equal angles, not congruent because corresponding longest sides differ. Length ratio is $15/9 = 5/3$ and larger-to-smaller area ratio is $25/9$.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence. Accurate conditions, checks or qualification.

3.4 Use the same compass radius, greater than half AB, to draw arcs centred at A and B meeting at P and Q on opposite sides. Draw PQ. PA=PB and QA=QB by equal radii. Thus both P and Q lie on the locus equidistant from A and B; PQ is the perpendicular bisector. Equivalently use congruent triangles and the common chord to establish perpendicularity and bisection. A ruler reading on one picture does not prove the general locus. SSS proves the two stated triangles congruent, fixing size as well as shape; Pythagoras also shows these particular triangles are right-angled.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence. Accurate conditions, checks or qualification.

3.5 Parallelism gives the matching corresponding angle 68°. The adjacent pair forms a straight angle, so the other is 180°−68°=112°. Equal corresponding angles require the stated parallel lines; the straight-angle sum uses adjacency on one line. A similar-looking sketch without parallelism would not justify the first equality.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence. Accurate conditions, checks or qualification.