2) b- (d) ⊥ (AC) are perp if the product of their slopes is -1

$a_{(d)} \times a_{(AC)} \overset{?}{=} -1$

$\left(\frac{-1}{2}\right)(1) \overset{?}{=} -1$

$\frac{-1}{2} \neq -1$

Thus (d) ⊥ (AC) are not perp.

3) a- M is the midpt of [AB] (given)

So, $x_M = \frac{x_A + x_B}{2}$ $\quad y_M = \frac{y_A + y_B}{2}$

$= \frac{1+5}{2}$ $\quad = \frac{3+1}{2}$

$= \frac{6}{2}$ $\quad = \frac{4}{2}$

$x_M = 3$ $\quad y_M = 2$

M (3; 2)

b) M is the midpoint of [AB] (given)

But (Δ) is the median relative to [AB] (given) is drawn from vertex

So, M belongs to (Δ) (median ^ cuts the segment at its midpt)

Then coordinates of M+C must satisfy eqn of (Δ)

(Δ): $\frac{y-y_C}{x-x_C} = \frac{y_M-y_C}{x_M-x_C}$ $\quad \frac{y-1}{x+1} = \frac{1}{4}$

$\frac{y-1}{x+1} = \frac{2-1}{3+1}$

So, $y-1 = \frac{1}{4}(x+1)$

Then, $y = \frac{1}{4}x + \frac{1}{4} + 1$.

Thus eqn of (Δ): $y = \frac{1}{4}x + \frac{5}{4}$

4) a- R is the symmetric of D wrt O (given)

So, O is the midpt of [RD]

$x_O = \frac{x_R + x_D}{2}$ $\quad y_O = \frac{y_R + y_D}{2}$

$0 = \frac{x_R + (-1)}{2}$ $\quad 0 = \frac{y_R + 4}{2}$

$x_R = 1$ $\quad$ & $\quad y_R = -4$

R (1, -4)