2nd exercise:

1a) $(d): 2x - y + 4 = 0$

So, $y = 2x + 4$. which is of the form $y = ax + b$.

Thus, slope of $(d) = a_{(d)} = 2$.

$(\ell): y = mx + 3x - 1$

$y = (m+3)x - 1$

Thus, $a_{(\ell)} = m + 3$.

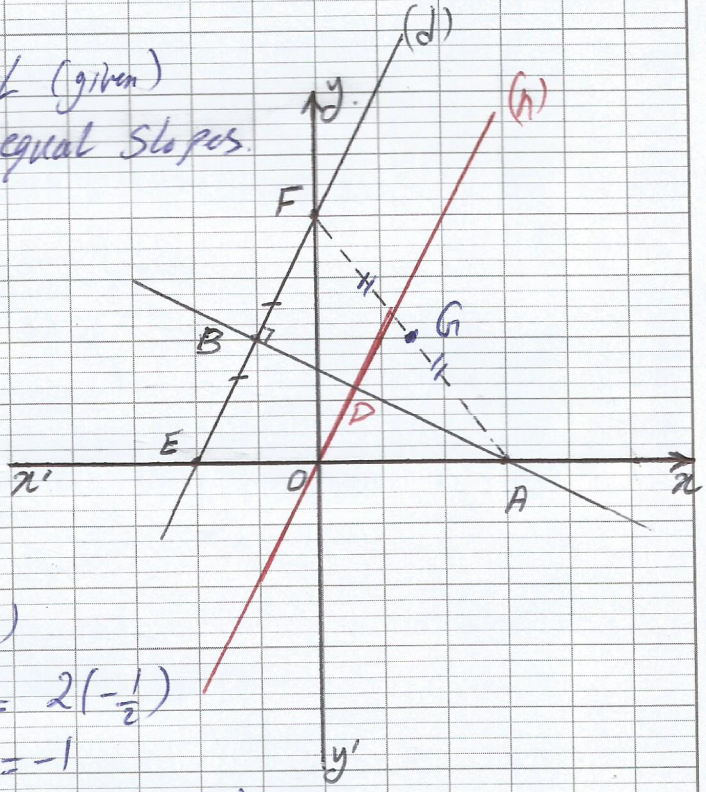
b) (d) & (ℓ) are parallel (given)

So, (d) & (ℓ) admit equal slopes.

So, $a_{(\ell)} = a_{(d)}$

$m + 3 = 2$

Thus, $\boxed{m = -1}$



c) If $m = -\frac{7}{2}$,

then $a_{(\ell)} = -\frac{7}{2} + 3$

$a_{(\ell)} = -\frac{1}{2}$

& $a_{(d)} = 2$ (proved)

but $a_{(\ell)} \times a_{(d)} = 2\left(-\frac{1}{2}\right)$

$= -1$

Thus, (d) & (ℓ) are perpendicular.

2) $A(3;0)$

Since ordinate of A; $y_A = 0$

then A belongs to x-axis.

3a) E is the x-intercept of (d) (given)

So, $y_E = 0$

& Coordinates of E satisfy eqn of (d).

Then, $y_E = 2x_E + 4$

$0 = 2x_E + 4$