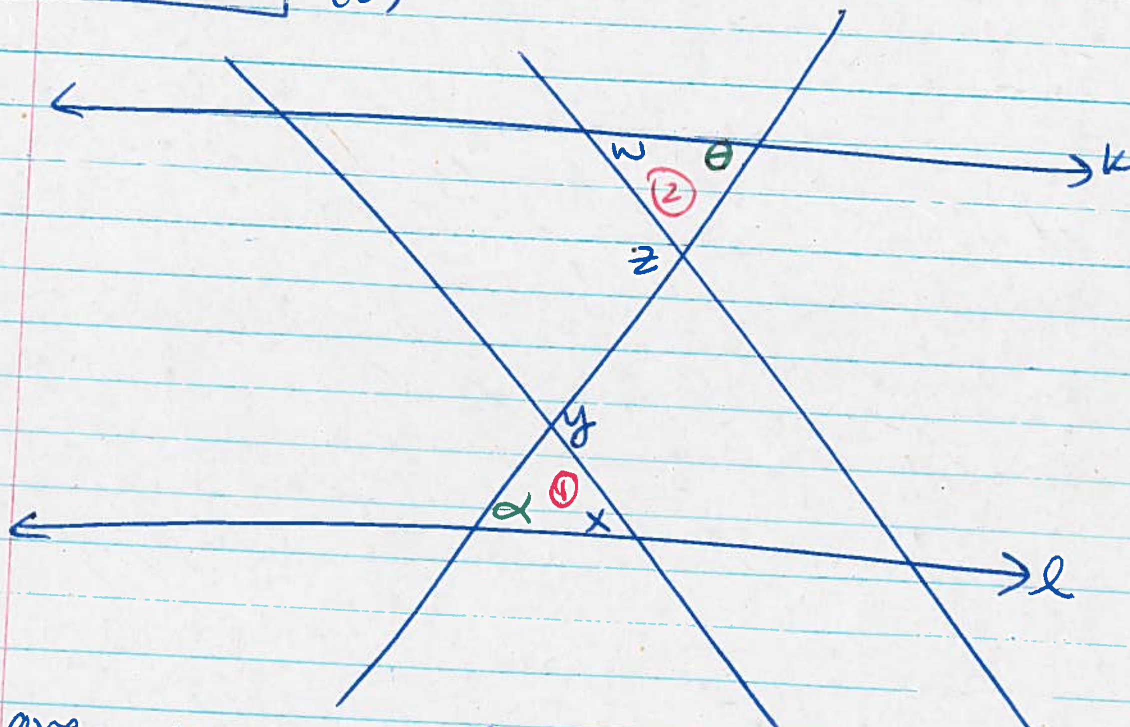
11.4 B #3 (b)



given $y = x + z - w$ (A)

We want to prove line $k \parallel$ line l.

So if $\theta = \alpha$, then line $k \parallel$ line l
(since alt. int angles are $\cong$ iff $k \parallel l$)

From triangle (1): $\alpha + x + 180 - y = 180$
$\alpha + x - y = 0$
$\alpha + x = y$

From triangle (2): $w + \theta + 180 - z = 180$
$w + \theta - z = 0$
$w + \theta = z$

But we know $y = x + z - w$.

$\Rightarrow$ (A) and (1) give $\quad \alpha + x = x + z - w$

$\Leftrightarrow \quad \alpha = z - w$

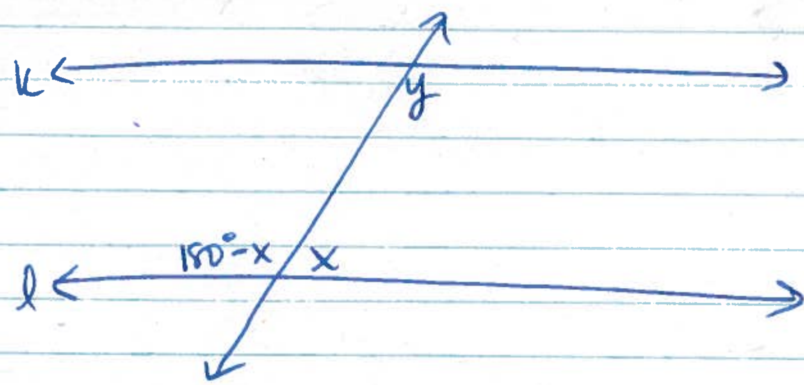
(1a) $\Leftrightarrow \quad z = \alpha + w$

$\Rightarrow$ (1a) and (2) give $\quad \alpha + w = \theta + w$

$\Leftrightarrow \quad \alpha = \theta$

$\Rightarrow$ Since $\alpha = \theta$, the lines, k and ℓ, are $\parallel$.

(a)



given:

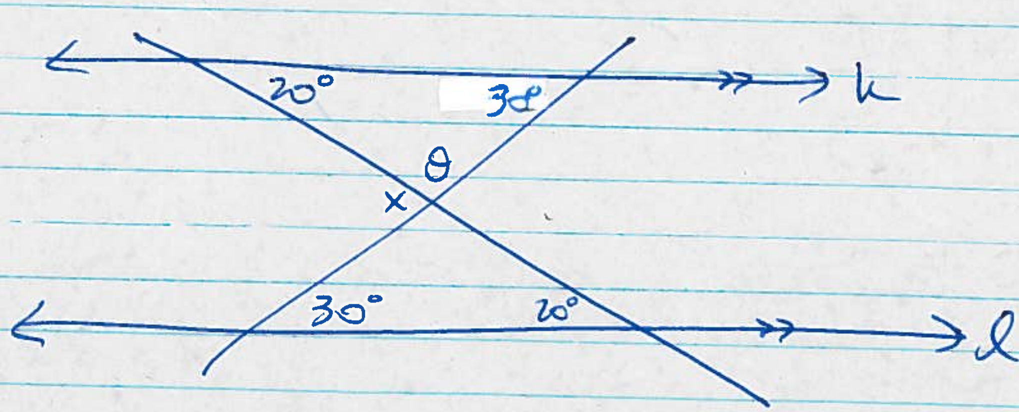
$x + y = 180°$

$\Leftrightarrow \quad x = 180° - y$

$180° - x = 180° - (180° - y) = y$

$\Rightarrow k \parallel \ell$ (because alt. int. angles are $\cong$)

(c)



$\theta = 180 - 20 - 30 = 130°$

$x + \theta = 180 \Rightarrow x = 50°$