Solución áreas de polígonos irregulares en el plano

Determine el área de los siguientes polígonos si se sabe que las coordenadas de sus vértices son:

a) $A(-1,3)$, $B(3,3)$, $C(6,-2)$, $D(-4,-4)$

$A_{\square} = 10 \cdot 7 = 70$

$A_{①} = \frac{3 \cdot 5}{2} = \frac{15}{2}$

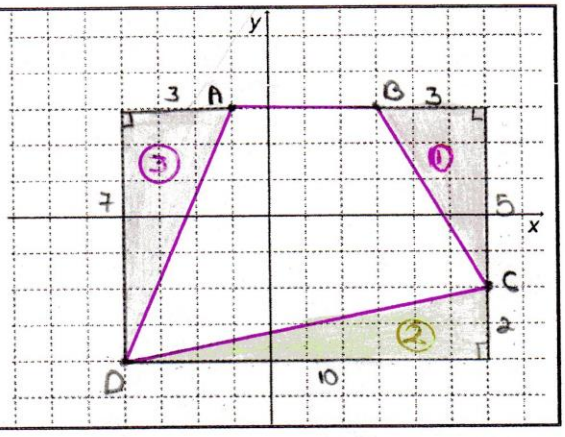
$A_{②} = \frac{10 \cdot 2}{2} = 10$

$A_{③} = \frac{3 \cdot 7}{2} = \frac{21}{2}$

$A_t = 28$

$A_t = 70 - 28$

$= 42\ ul^2$



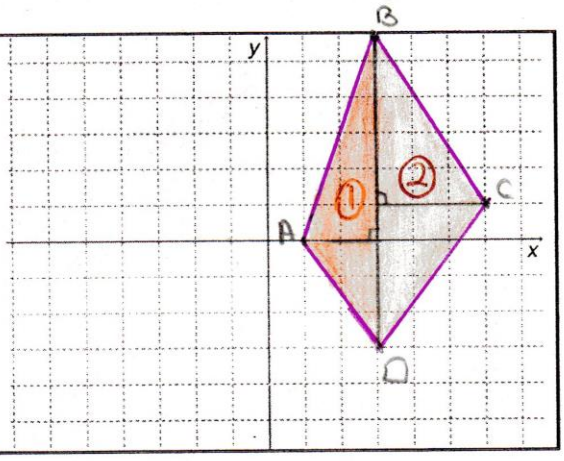
b) $A(1,0)$, $B(3,6)$, $C(6,1)$, $D(3,-4)$

$A_{①} = \frac{9 \cdot 2}{2} = 9$

$A_{②} = \frac{9 \cdot 3}{2} = \frac{27}{2}$

$A_t = A_{①} + A_{②}$

$= \frac{45}{2}\ ul^2$



c) $A(-2,6)$, $B(1,1)$, $C(4,3)$

$A_{ABCD} = 5 \cdot 6 = 30$

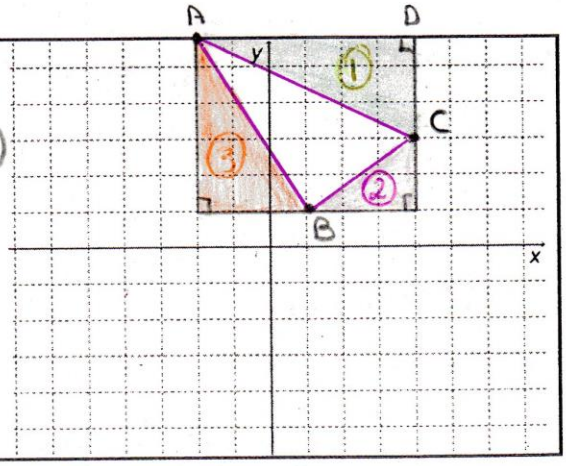
$A_{①} = \frac{3 \cdot 6}{2} = 9$

$A_{②} = \frac{3 \cdot 2}{2} = 3$

$A_{③} = \frac{3 \cdot 5}{2} = \frac{15}{2}$

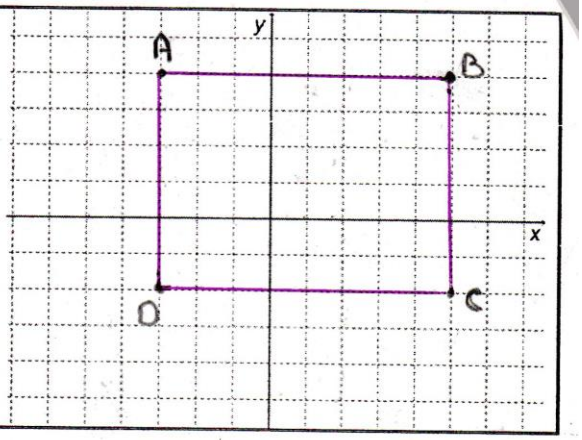
$A_t = A_D - (A_{①} + A_{②} + A_{③})$

$= \frac{21}{2}\ ul^2$



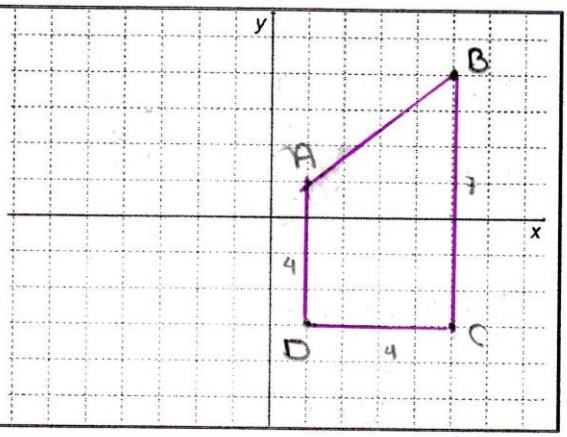
d) $A(-3,4)$, $B(5,4)$, $C(5,-2)$, $D(-3,-2)$

$A = 6 \cdot 8 = 48\,ul^2$



e) $A(1,1)$, $B(5,4)$, $C(5,-3)$, $D(1,-3)$

$A = \frac{(7+4)4}{2} = 22\,ul^2$



f) $A(-5,-1)$, $B(3,-2)$, $C(6,3)$, $D(-2,5)$

$A_{\square} = 7 \cdot 11 = 77$

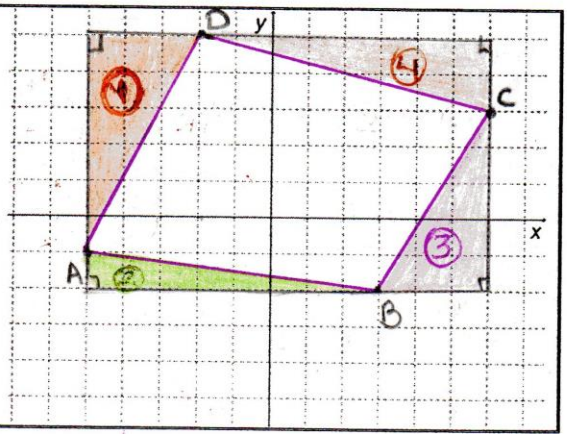
$A_{①} = \frac{3 \cdot 6}{2} = 9$

$A_{②} = \frac{8 \cdot 1}{2} = 4$

$A_{③} = \frac{3 \cdot 5}{2} = \frac{15}{2}$

$A_{④} = \frac{8 \cdot 2}{2} = 8$

$A_t = \frac{97}{2}\,ul^2$



Determine el área del polígono adjunto

$A_{\square} = 8 \cdot 8 = 64$

$A_{①} = \frac{8 \cdot 2}{2} = 8$

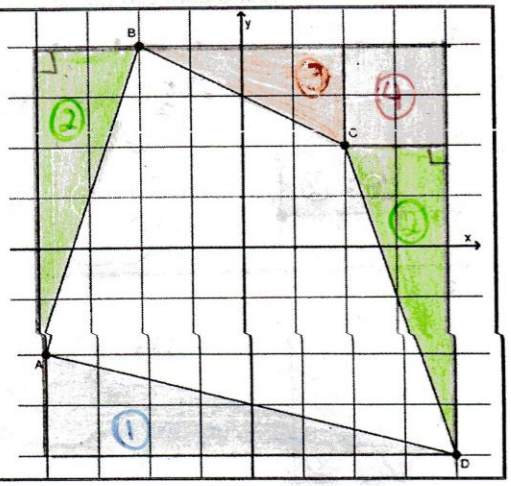
$A_{②} = \frac{6 \cdot 2}{2} = 6$

$A_{③} = \frac{4 \cdot 2}{2} = 4$

$A_{④} = 2 \cdot 2 = 4$

$A_t = A_{\square} - (A_① + A_② + A_③ + A_④)$

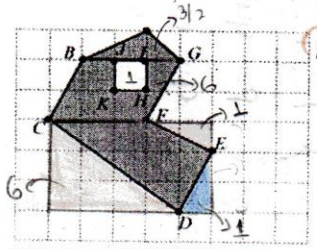
$= 36\ ul^2$



10)

Determine el área de cada región sombreada

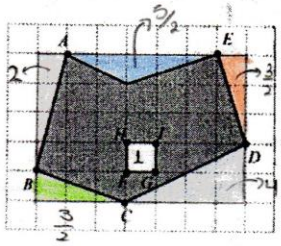
1)



$A_{\square} = 15$

$A = \frac{27}{2} ul^2$

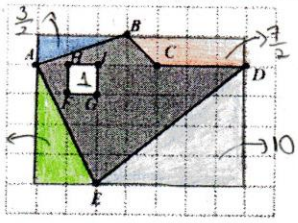
2)



$A_{\square} = 35$

$A_t = \frac{45}{2} ul^2$

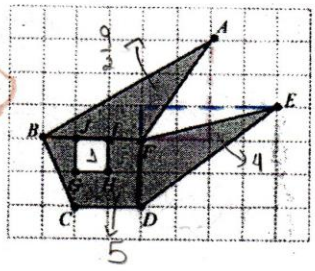
3)



$A_{\square} = 35$

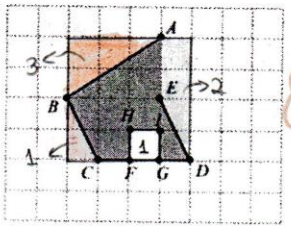
$A_t = 15 ul^2$

4)



$A_t = \frac{25}{2} ul^2$

5)



$A_{\square} = 16$

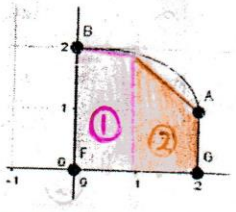
$A_t = 9 ul^2$

$h\ \Delta EFD$

$h\ \Delta BFA$

11) Utilice un polígono para estimar el área y el perímetro de las regiones no poligonales sombreadas.

1.

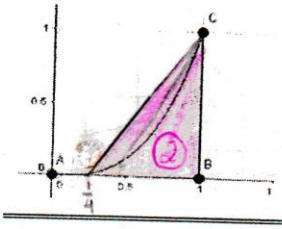


$A_t \approx A_{①} + A_{②}$

$\approx 2 + \frac{3}{2}$

$\approx \frac{7}{2} ul^2$

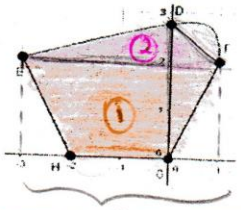
2.



$A_t \approx A_{\triangle}$

$\approx \frac{3}{8} ul^2$

3.



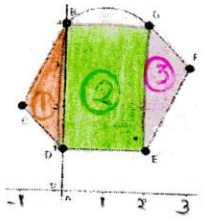
$A_t \approx A_{①} + A_{②}$

$\approx \frac{(4+2)2}{2} + \frac{4 \cdot 1}{2}$

$= 8 ul^2$

Estas áreas se aproximan, por que no hay figuras planas que las contengan completamente

4.



$A_t \approx A_{①} + A_{②} + A_{③}$

$\approx \frac{3 \cdot 1}{2} + 2 \cdot 3 + \frac{3 \cdot 1}{2}$

$\approx 9 ul^2$