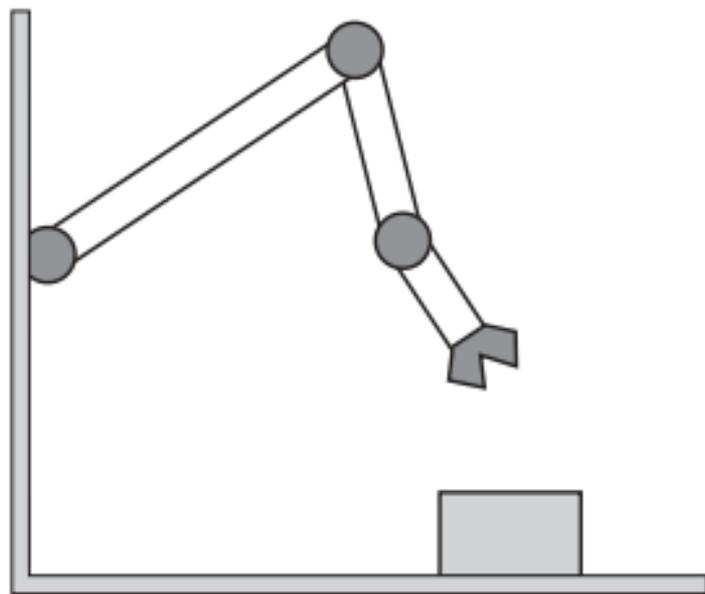
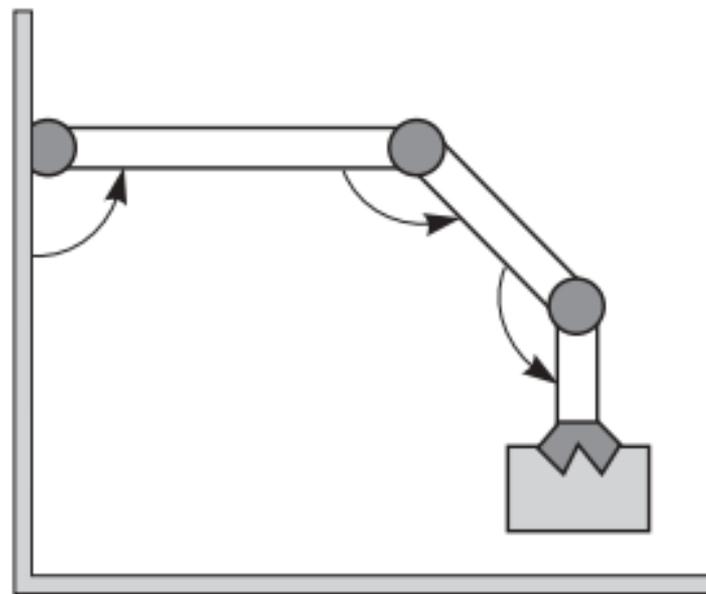


Figura 1. Hierarquia de uma casa.

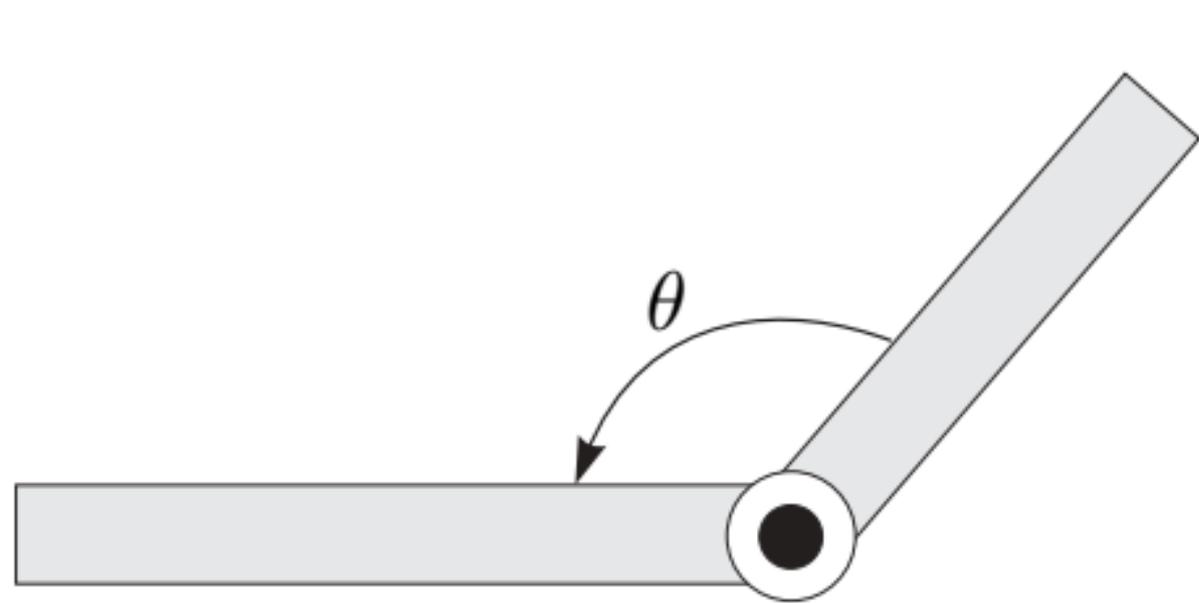


(a)

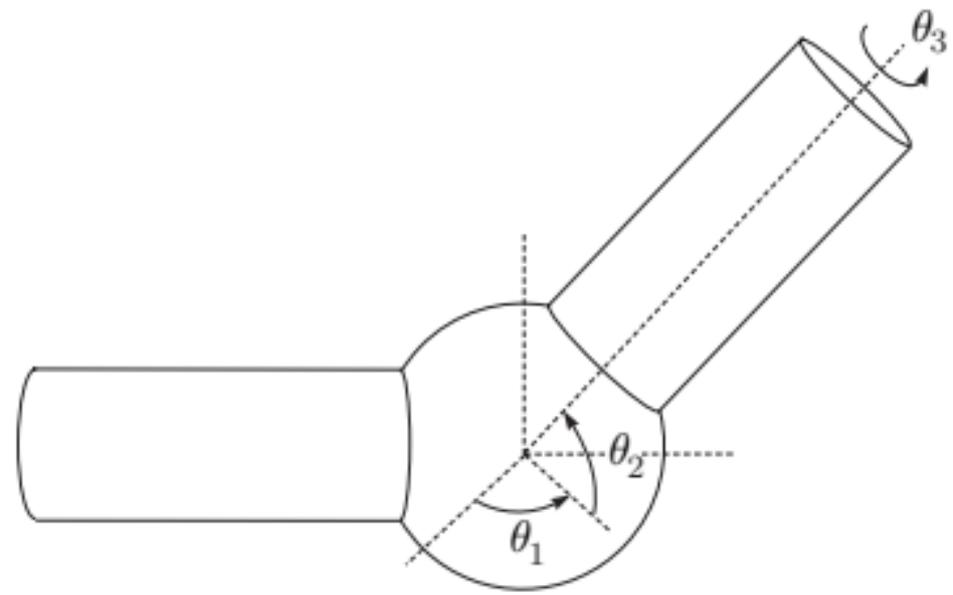


(b)

Figura 2. Braço de um robô (a) e “end-effector” (b)(da Silva, 1998).



(a)



(b)

Figura 3. Junta de revolução (a) e junta esférica (b).

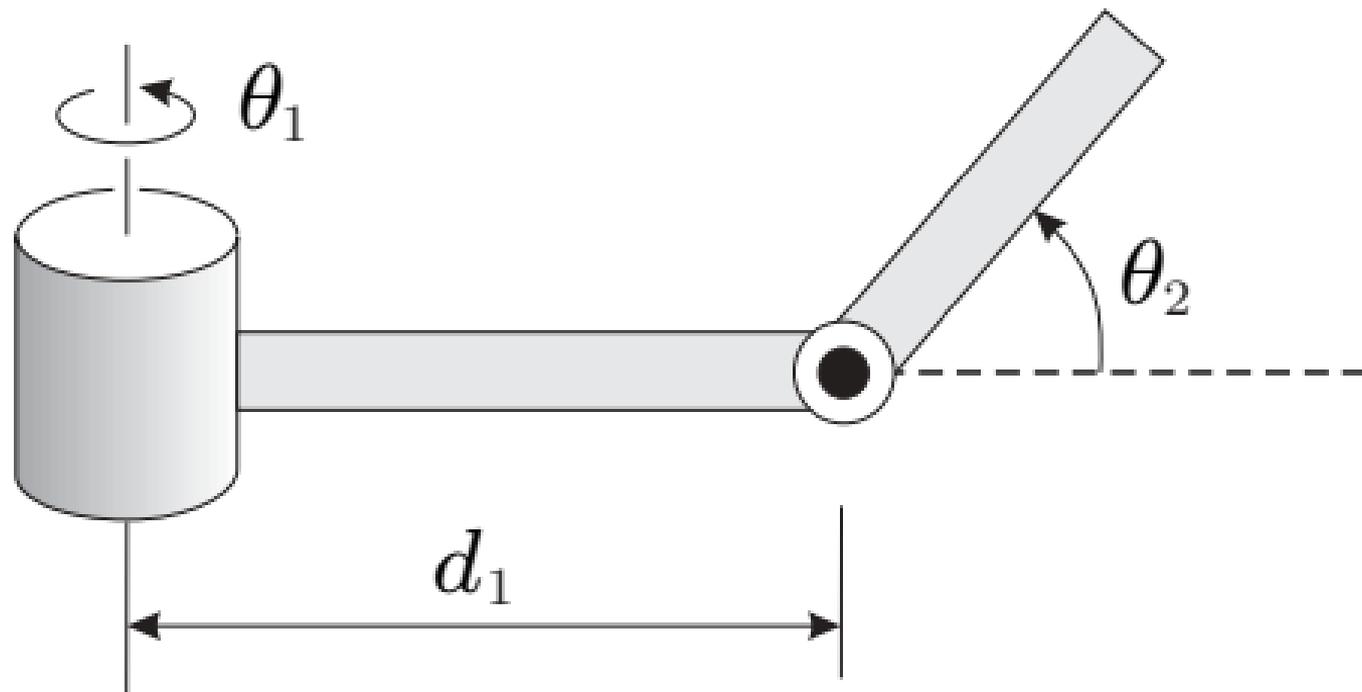


Figura 4. Estrutura articulada com dois graus de liberdade.

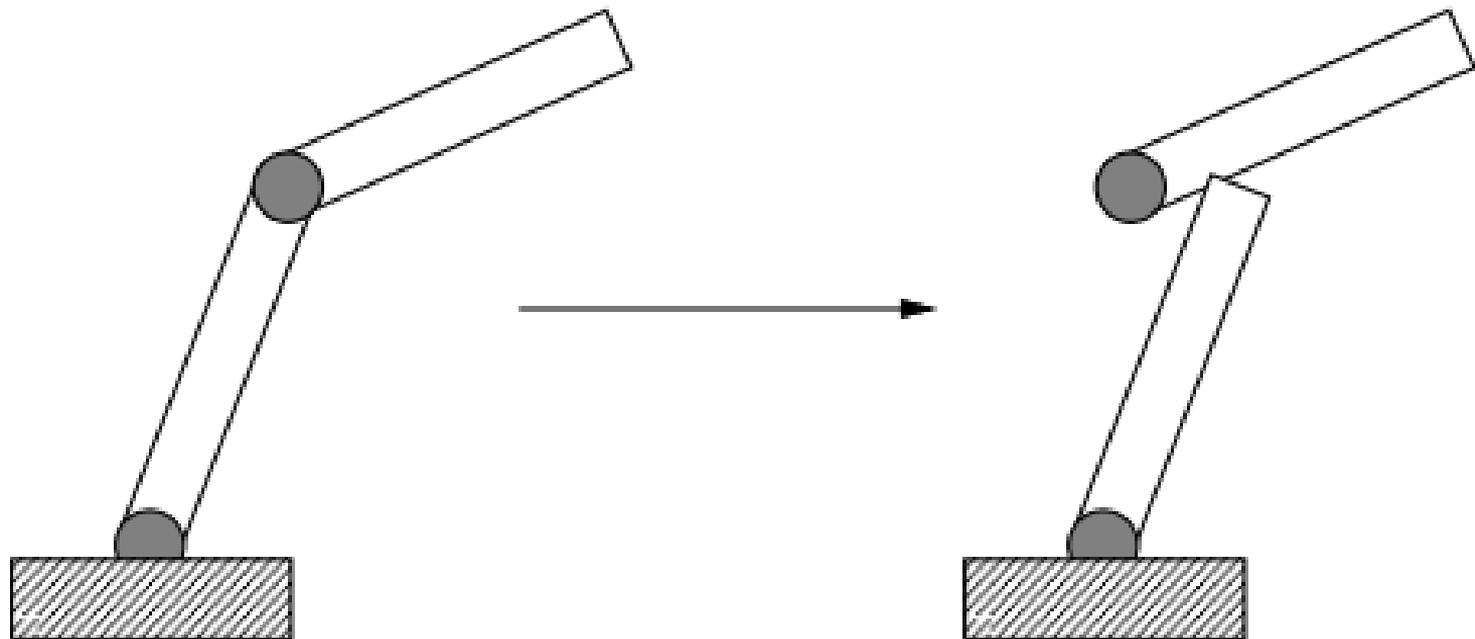


Figura 5. Ruptura da estrutura de vínculo (da Silva, 1998).

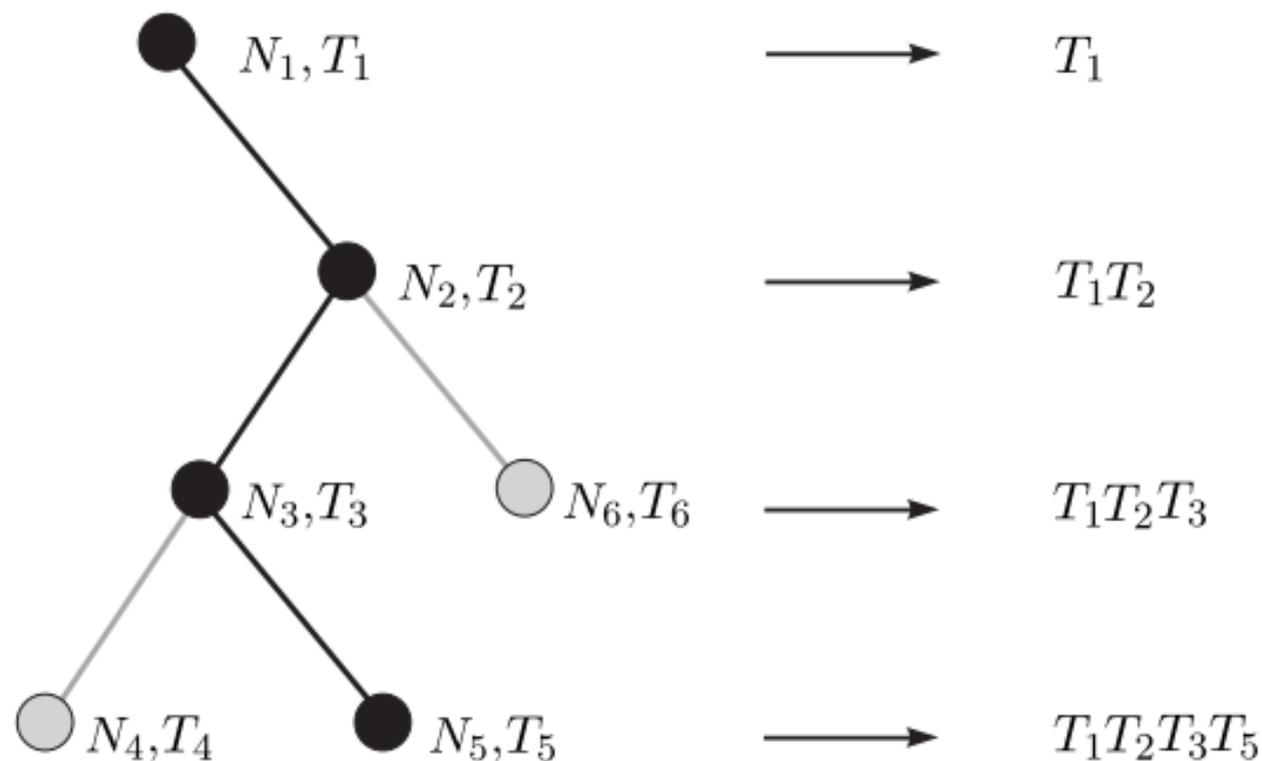
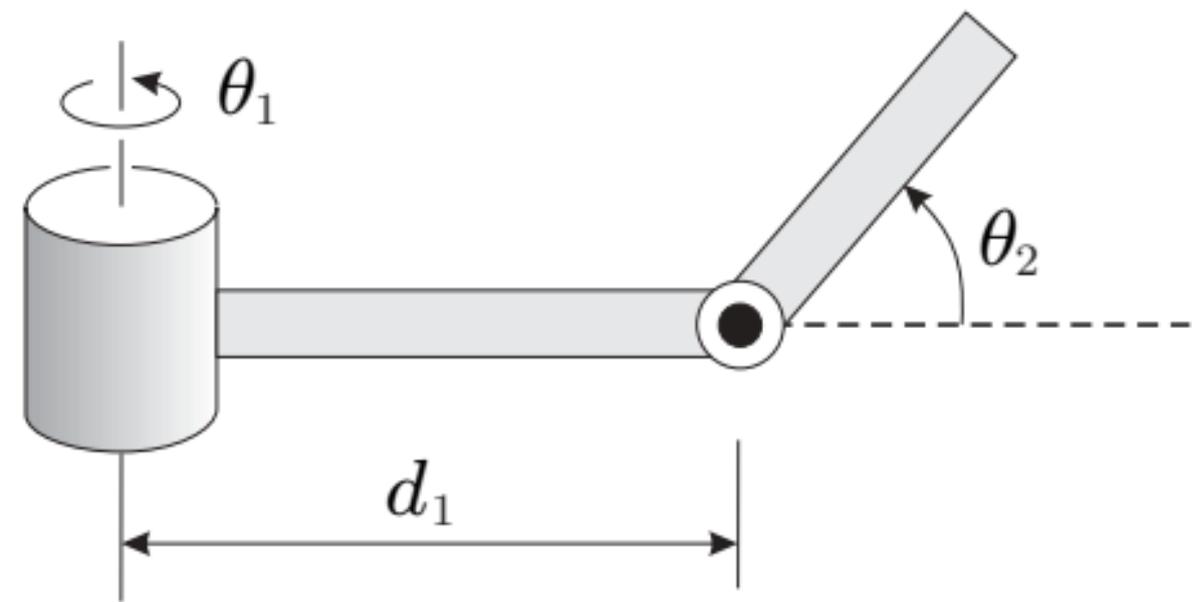
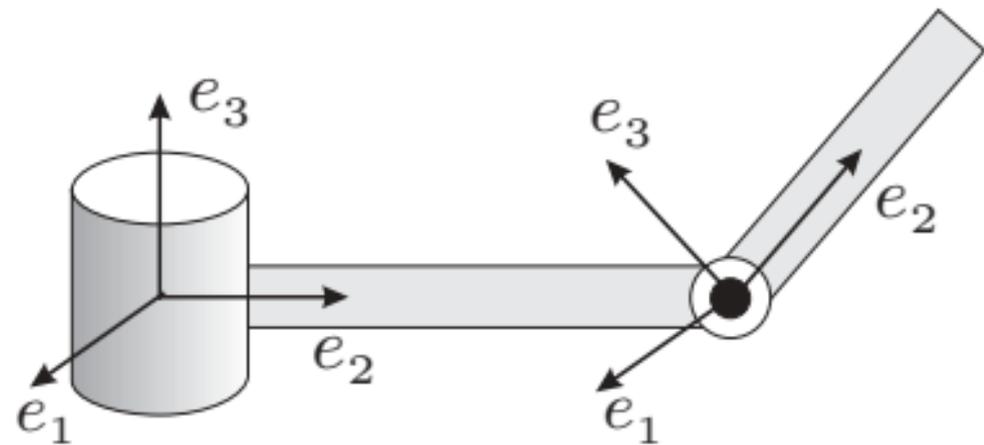


Figura 6. Hierarquia, árvore e transformações.

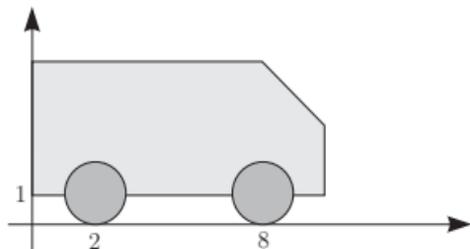


(a)

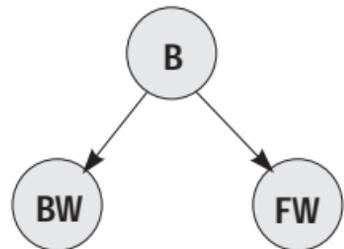


(b)

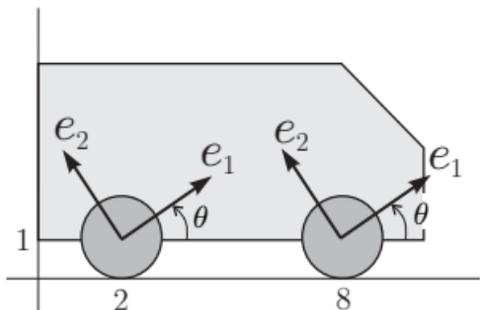
Figura 7. Estrutura articulada com dois graus de liberdade.



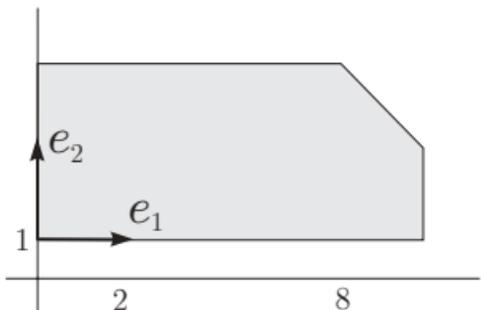
(a)



(b)

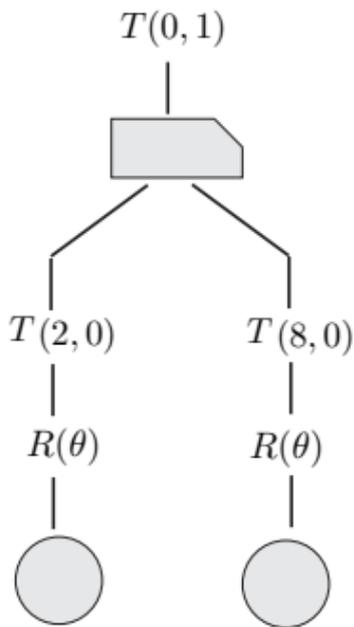


(c)

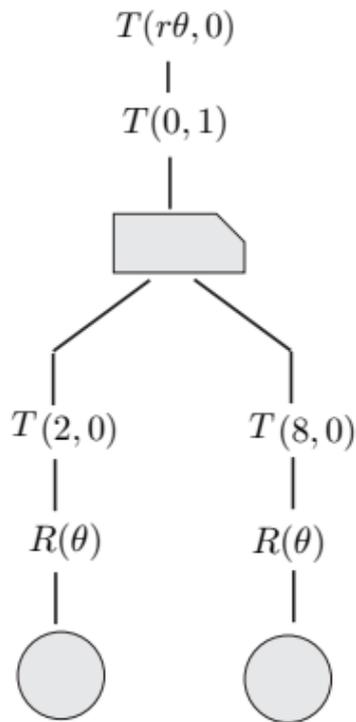


(d)

Figura 8. Carro (a) e árvore da hierarquia (b).



(a)



(b)

Figura 9. Carro e hierarquia.

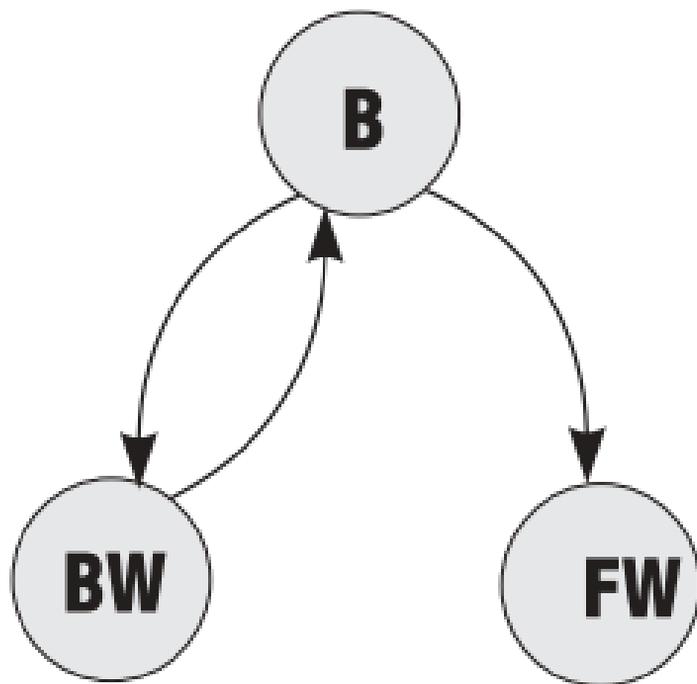


Figura 10. Grafo de uma hierarquia.

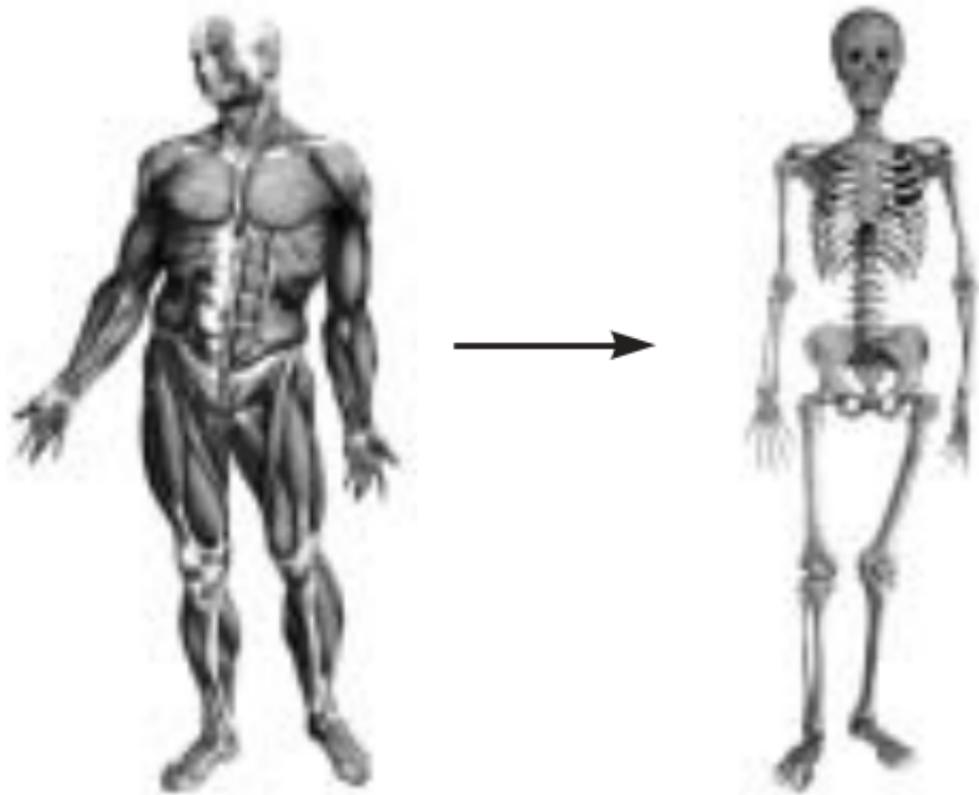


Figura 11. Aparelho locomotor: músculos + esqueleto.

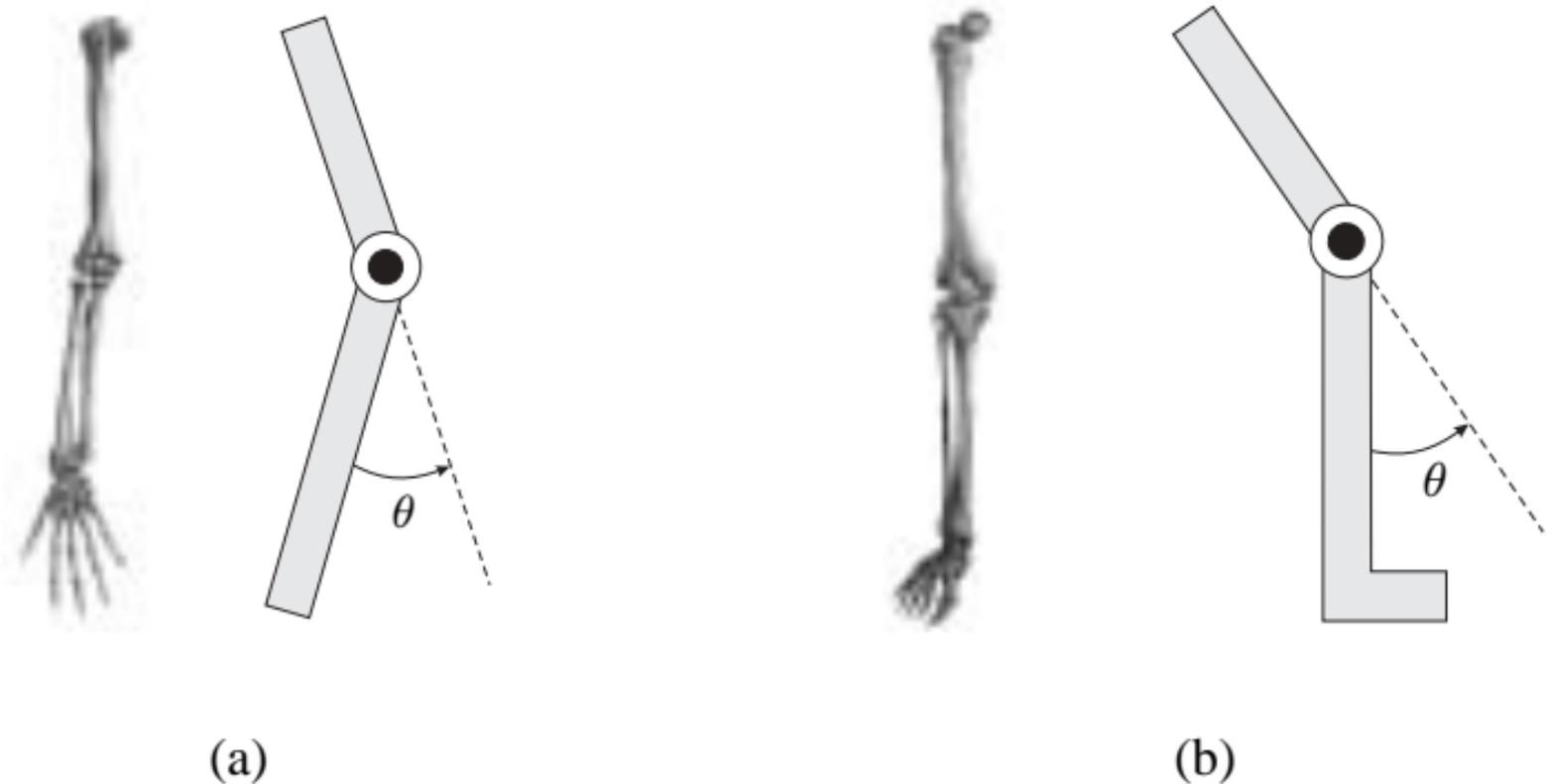


Figura 12. Simplificação do braço (a) e da perna (b).

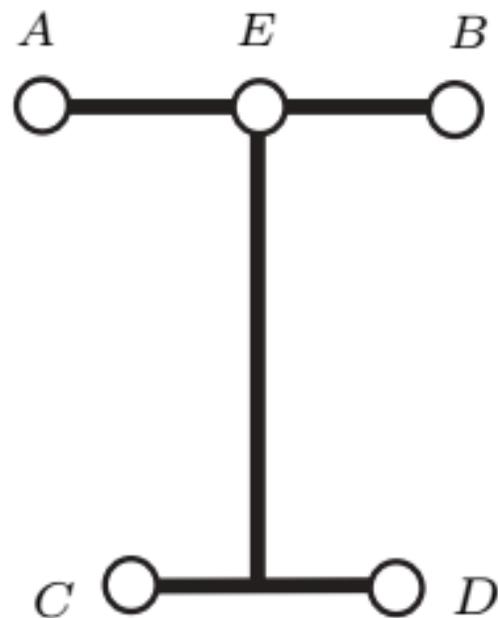
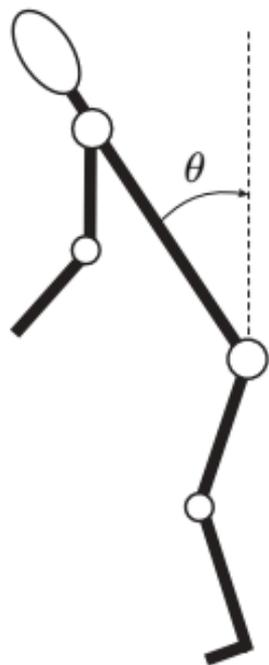
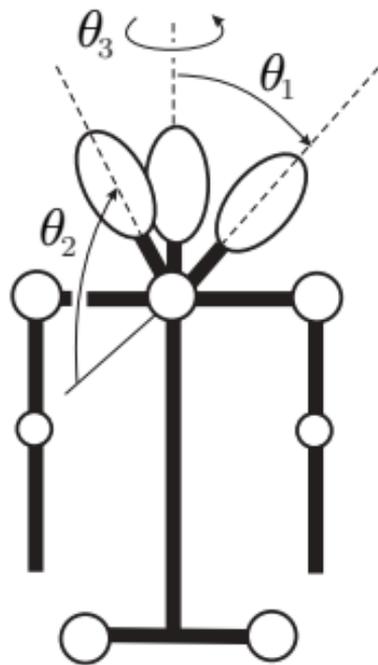


Figura 13. Tronco simplificado, e juntas de conexão.



(a)



(b)

Figura 14. Grau de liberdade do tronco (a) e da cabeça (b).

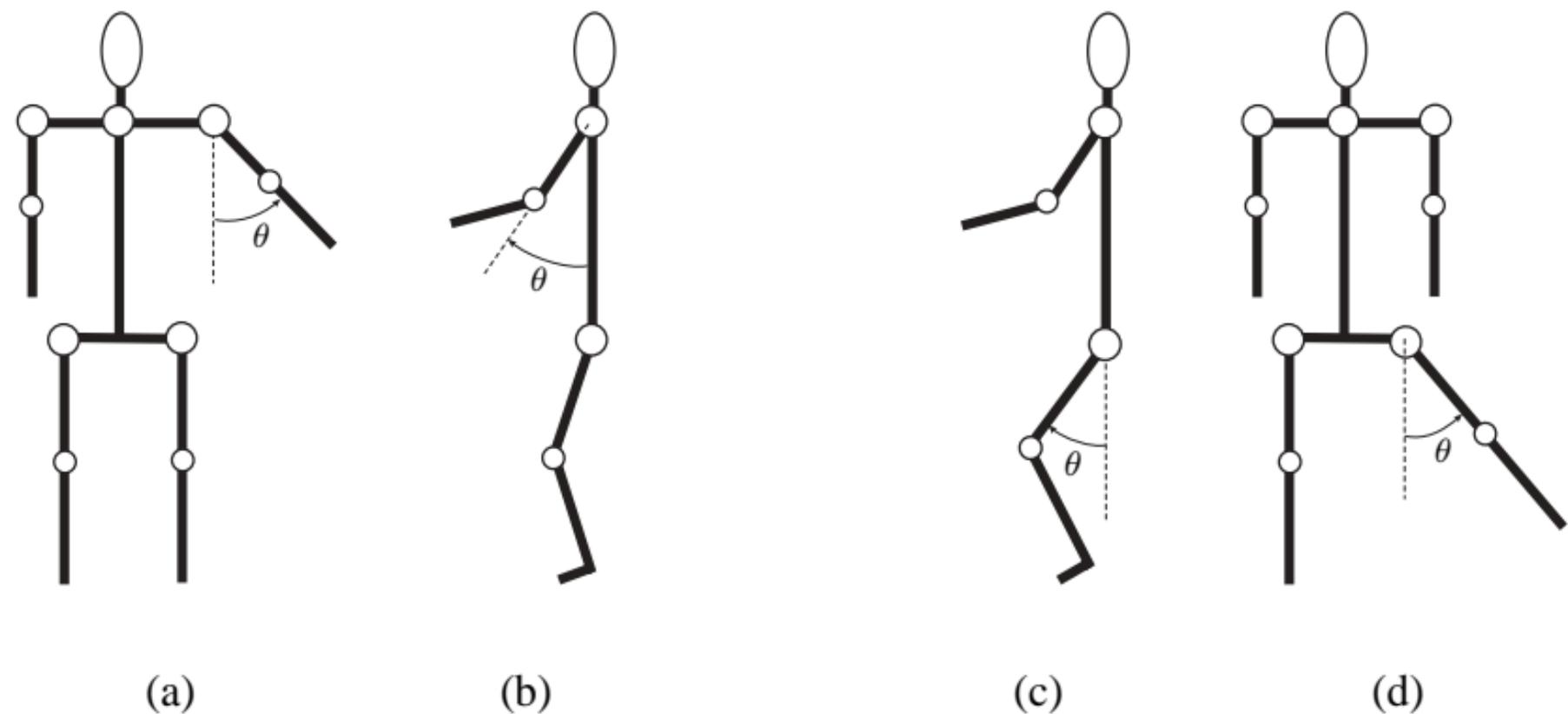


Figura 15. Graus de liberdade do braço (a), (b) e pernas (c) (d).

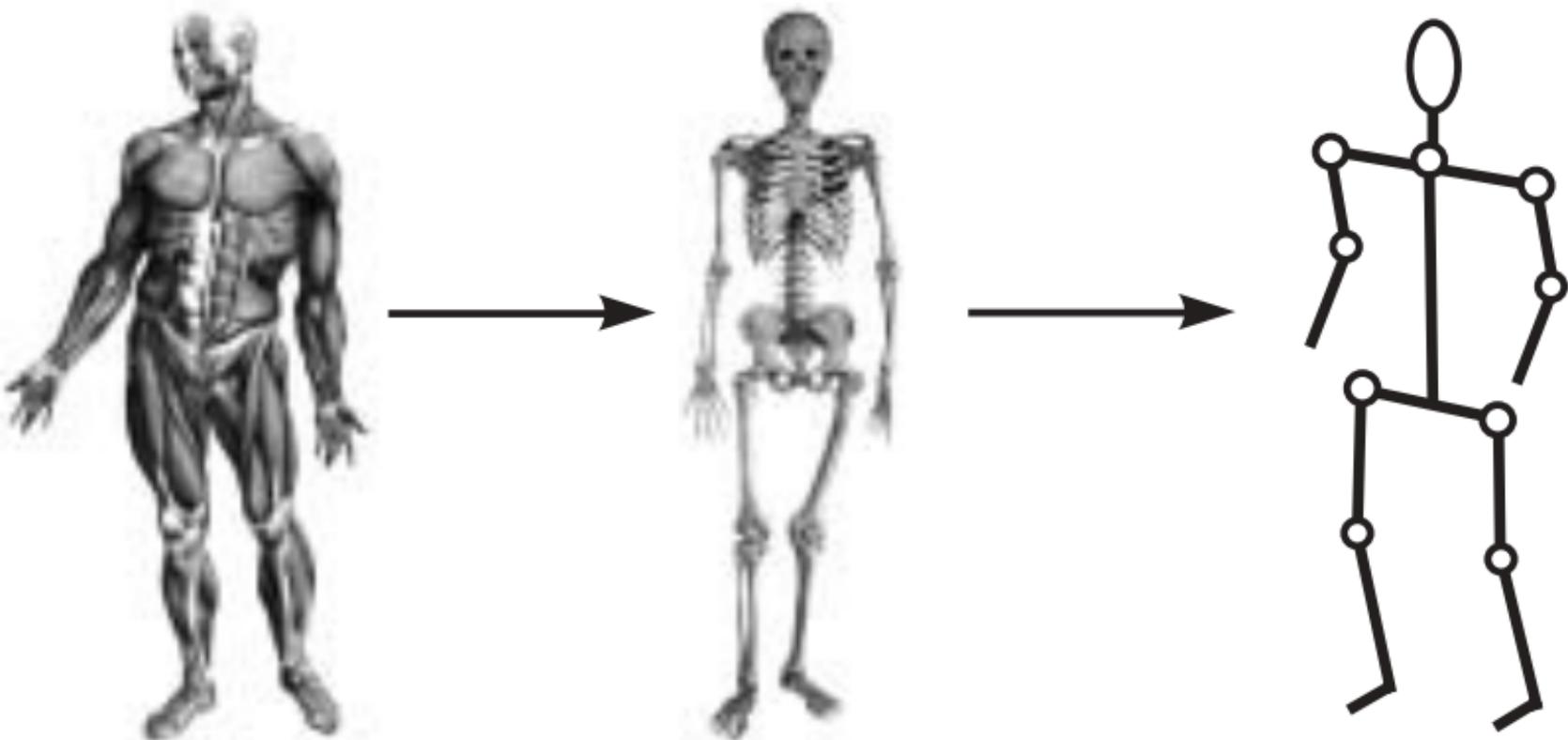


Figura 16. Do sistema locomotor a *joe-stick*.

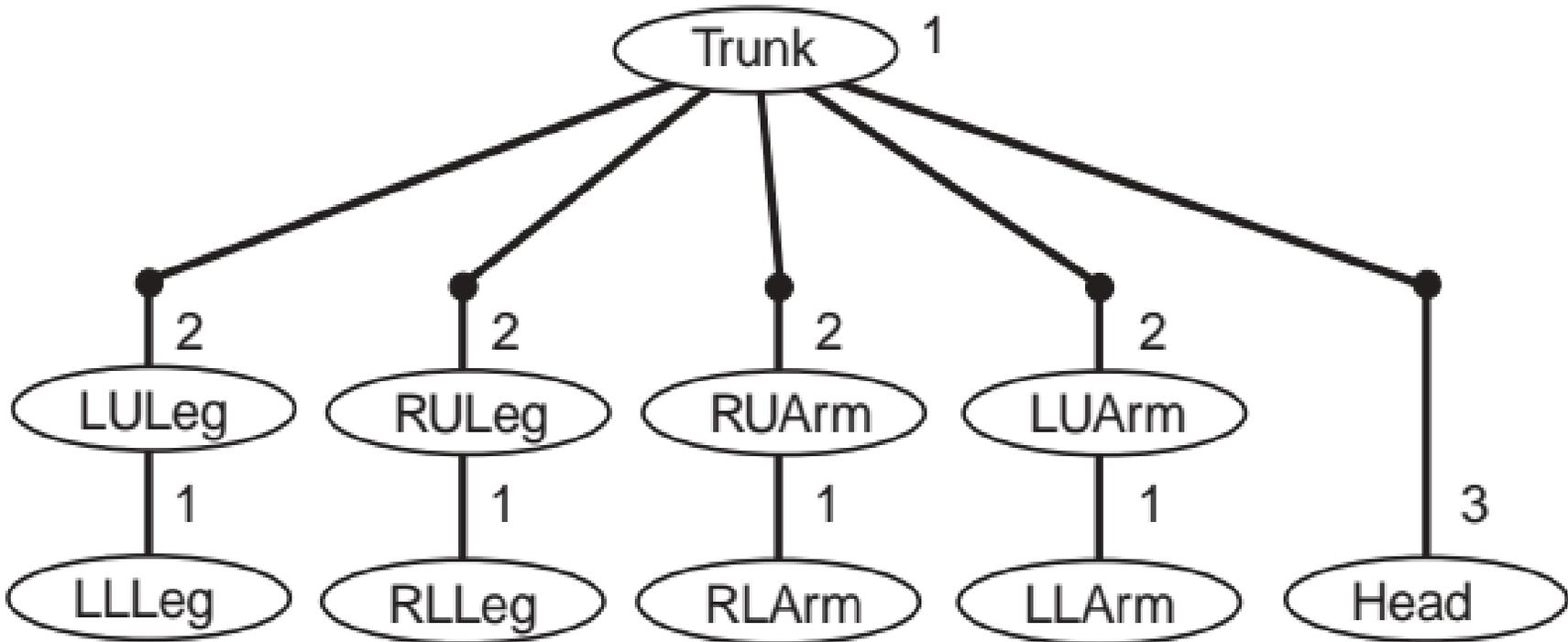


Figura 17. Árvore da hierarquia de *joe-stick*.

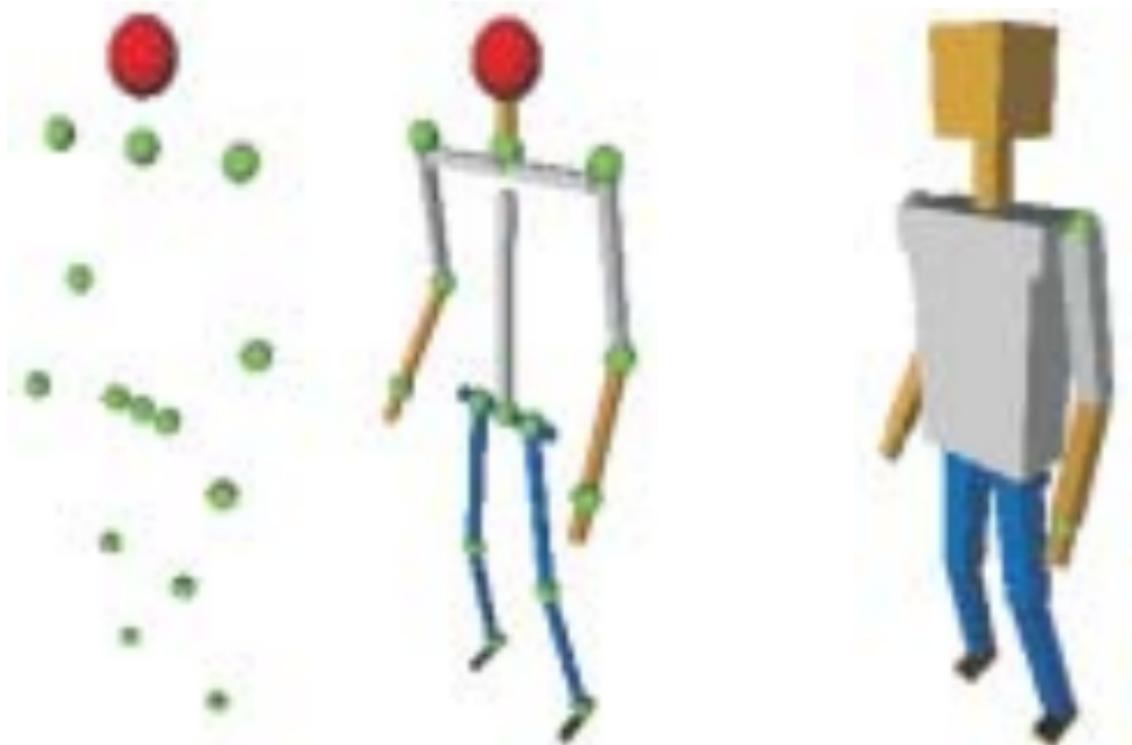


Figura 18. Possíveis modelos do *joe-stick*(da Silva, 1998).

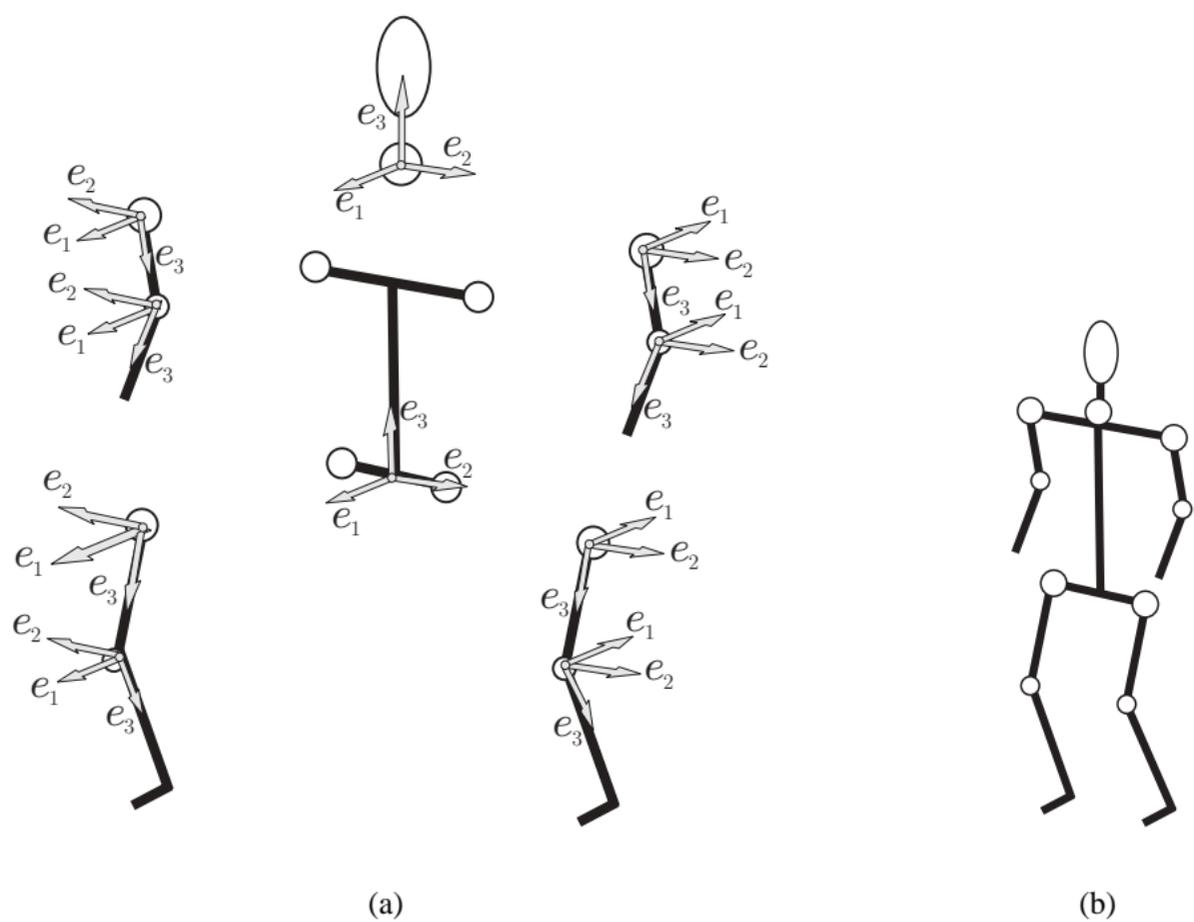


Figura 19. Referenciais da hierarquia de Joe-stick.

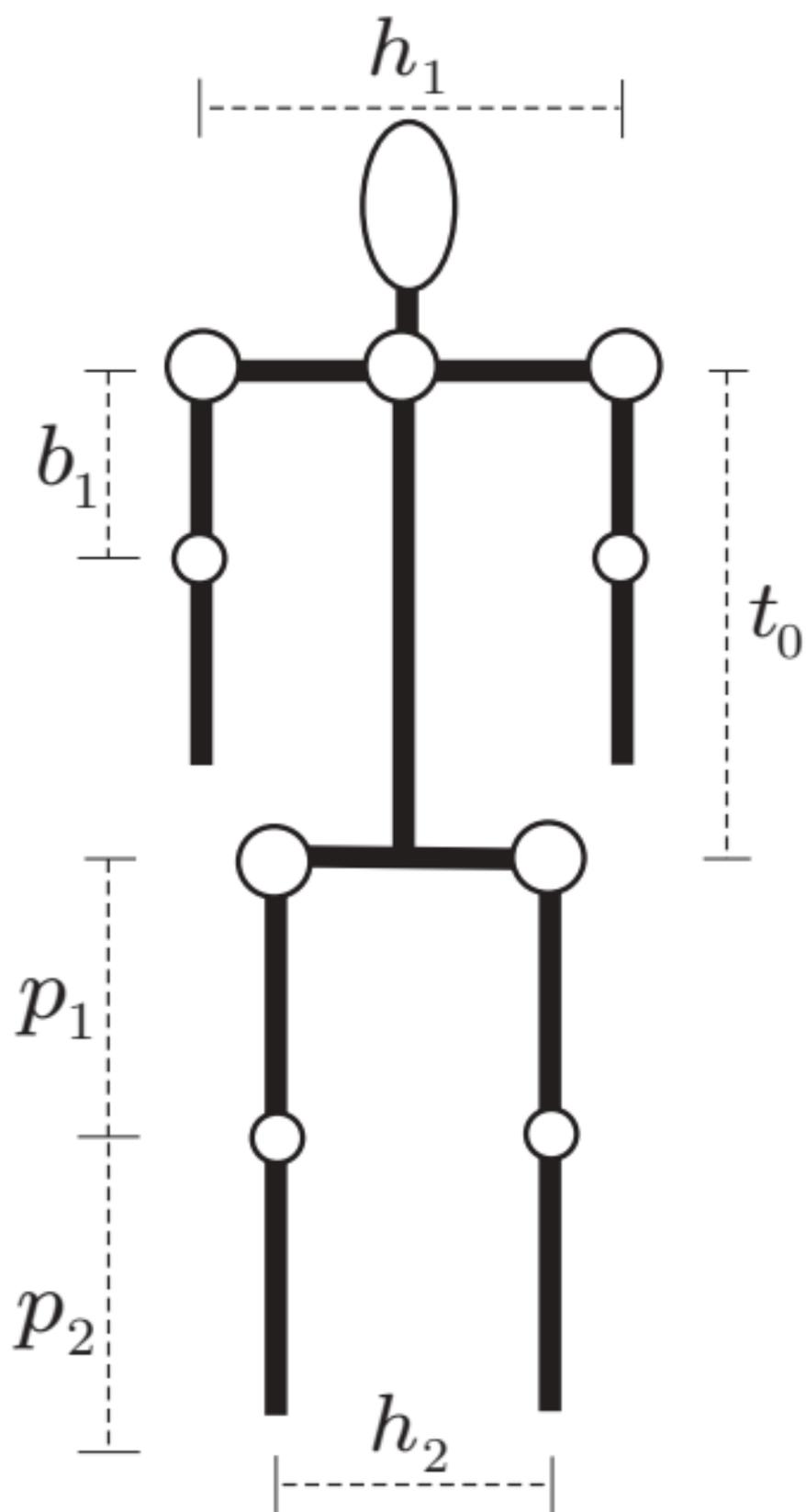


Figura 20. Dimensões de *joe-stick*.

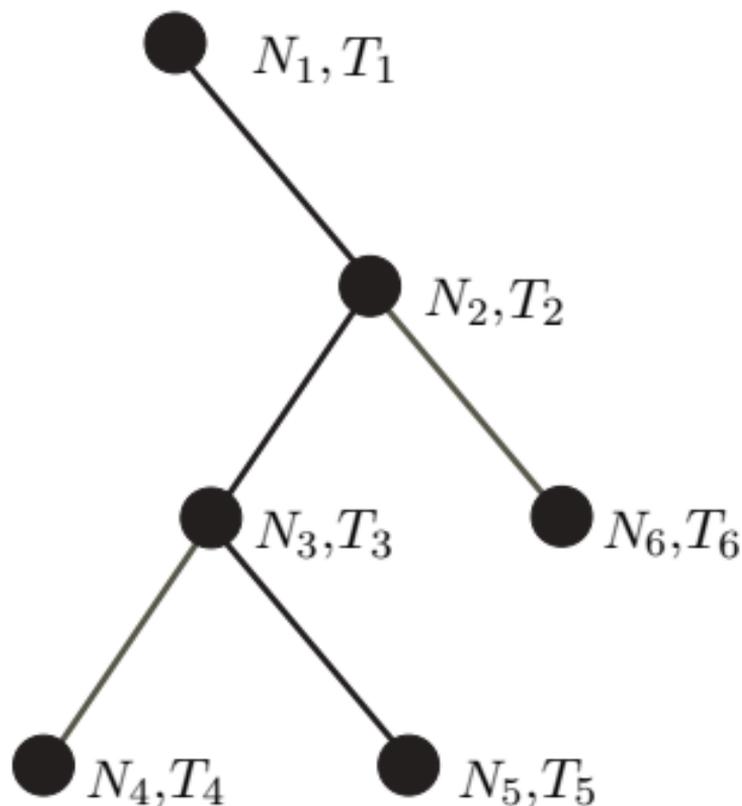


Figura 21. Árvore de uma hierarquia.

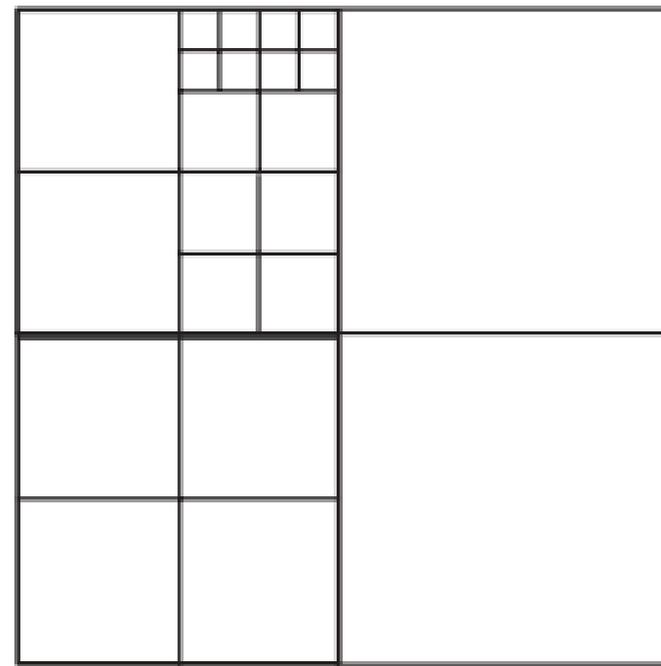
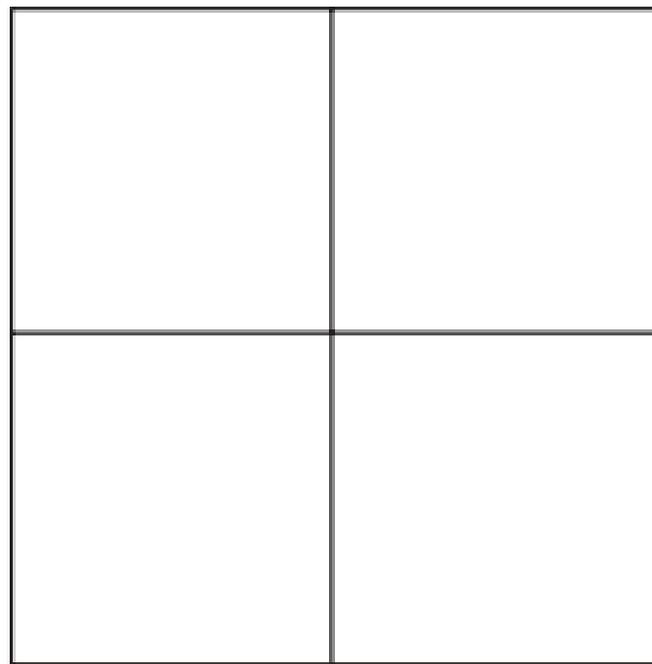
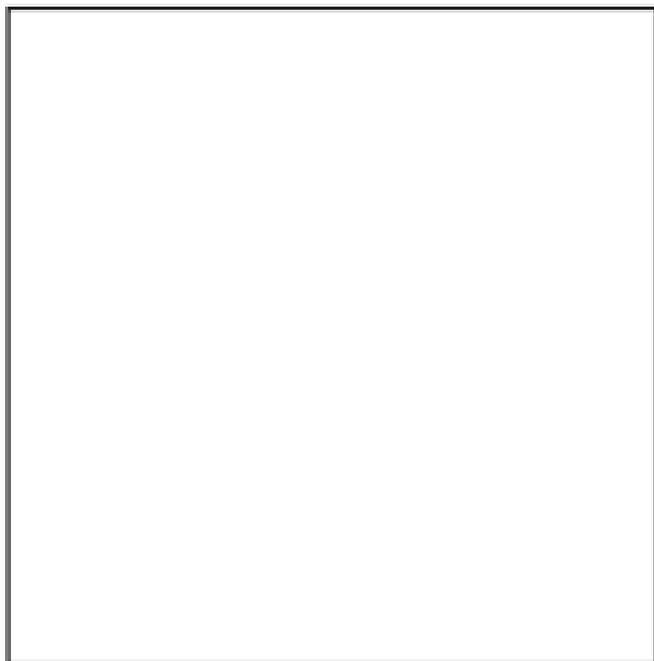


Figura 22. Quadtree.

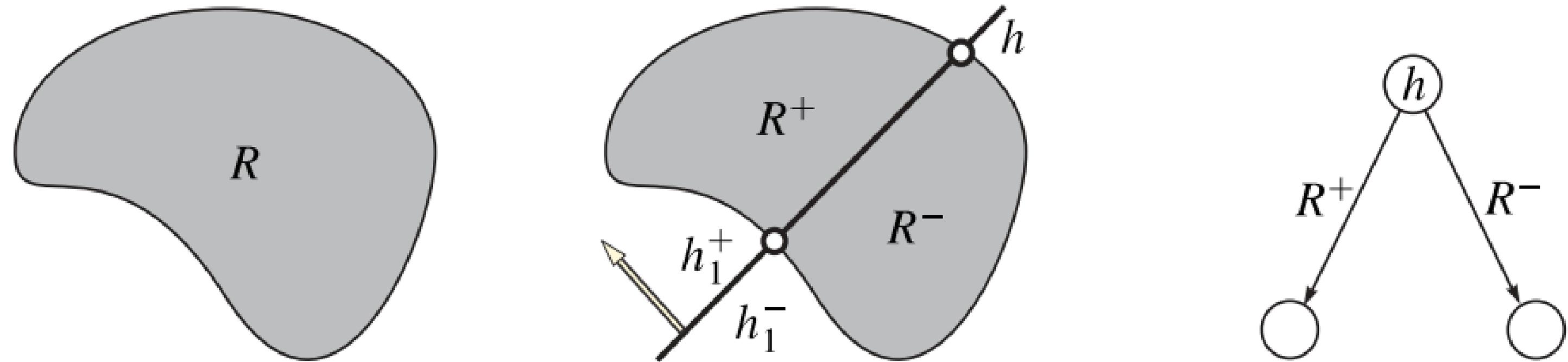


Figura 23. Particionamento binário.

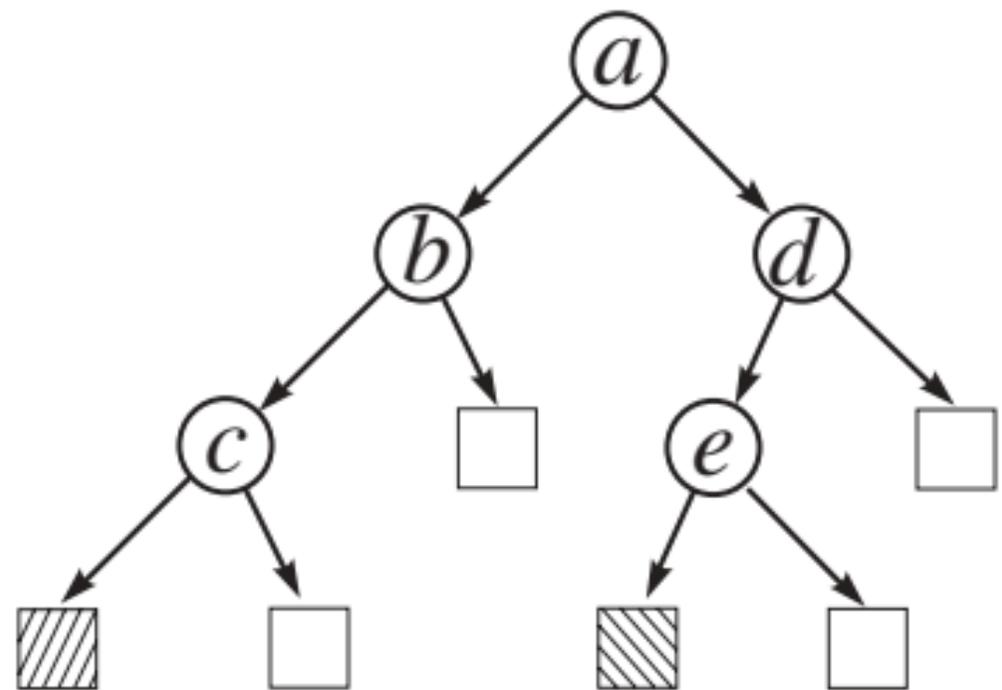
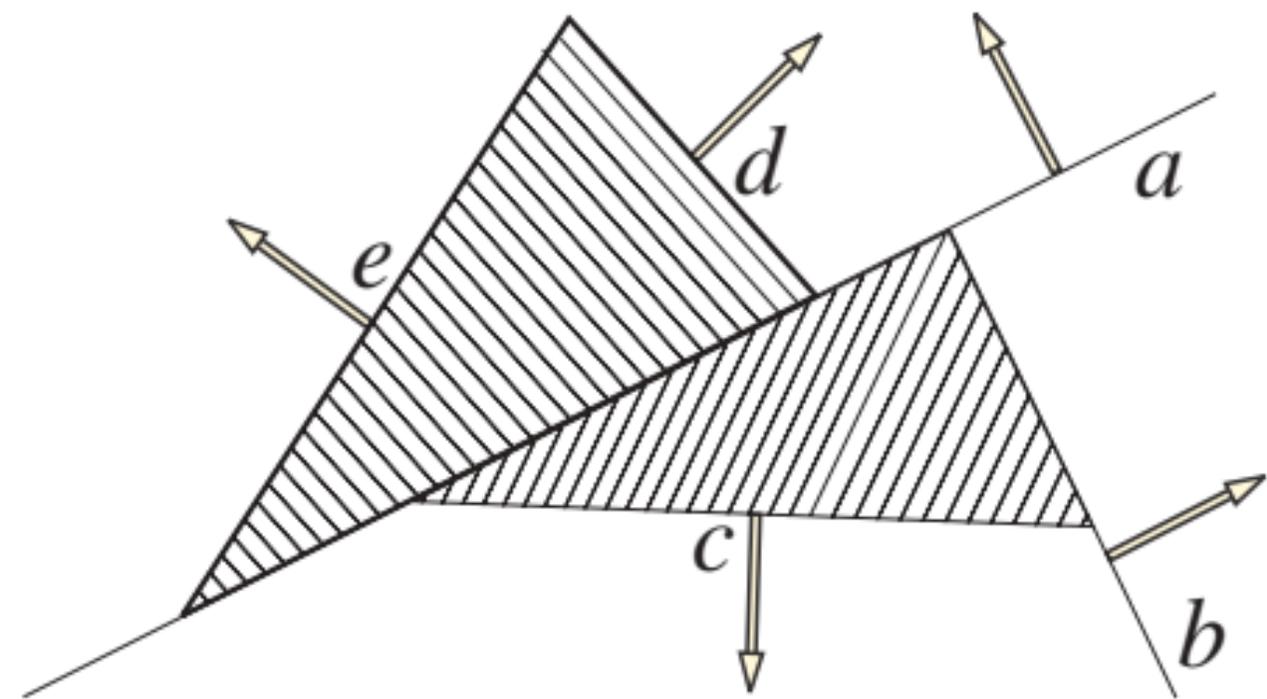


Figura 24. Árvore de particionamento.

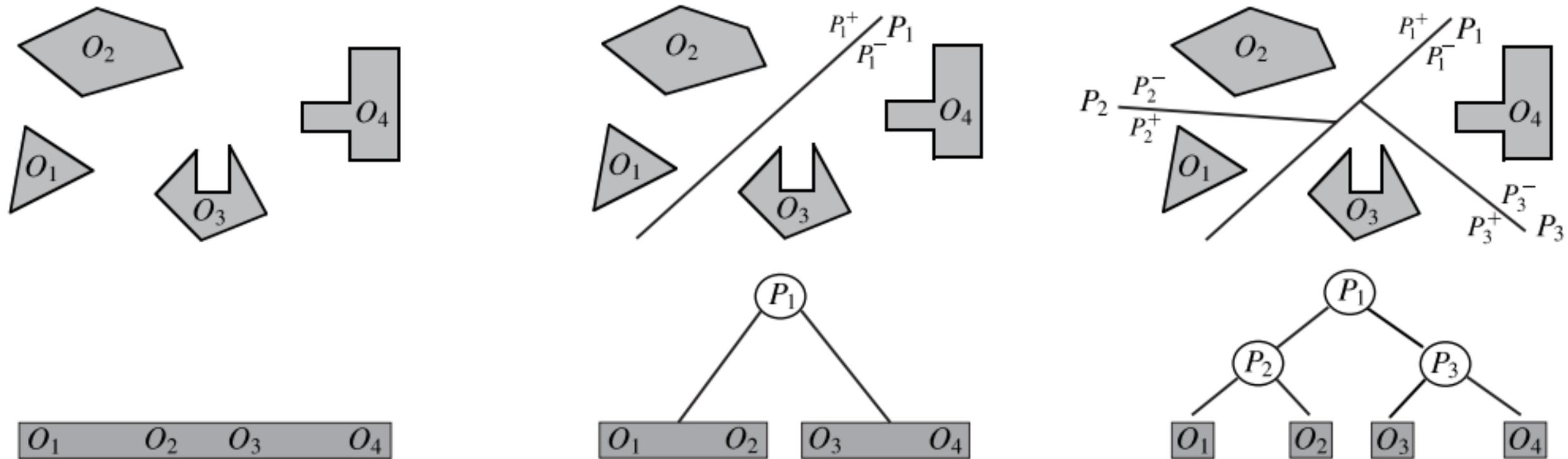
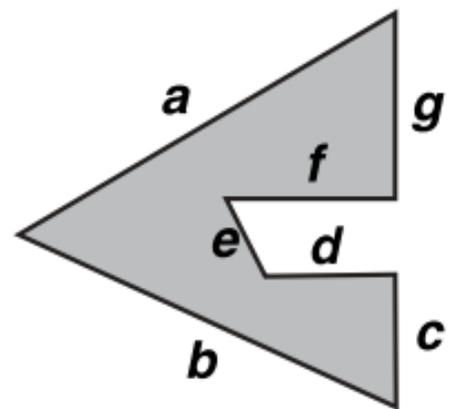
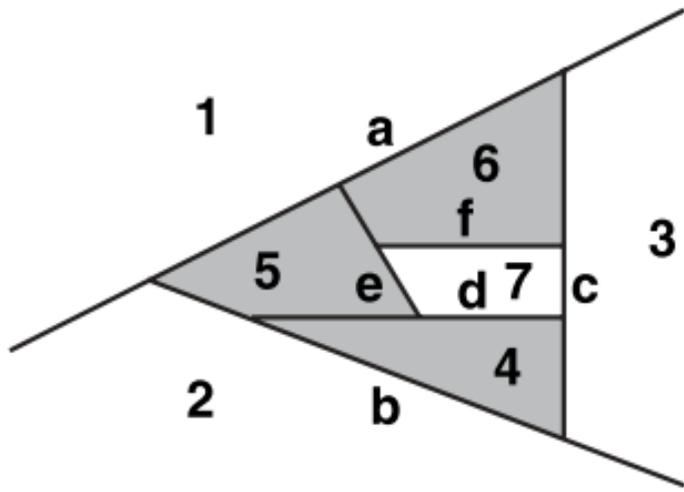


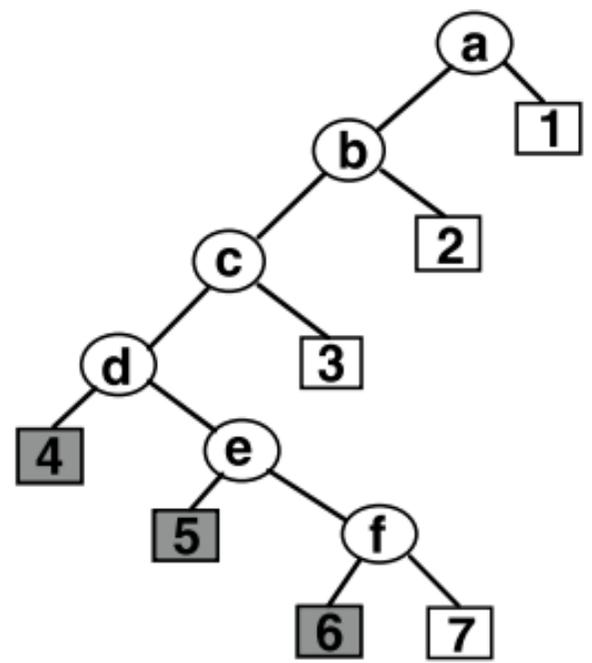
Figura 25. Separação de objetos por particionamento.



Sólido 2D poligonal



Partição do espaço



BSP-tree

Figura 26. Árvore de particionamento e geometria.

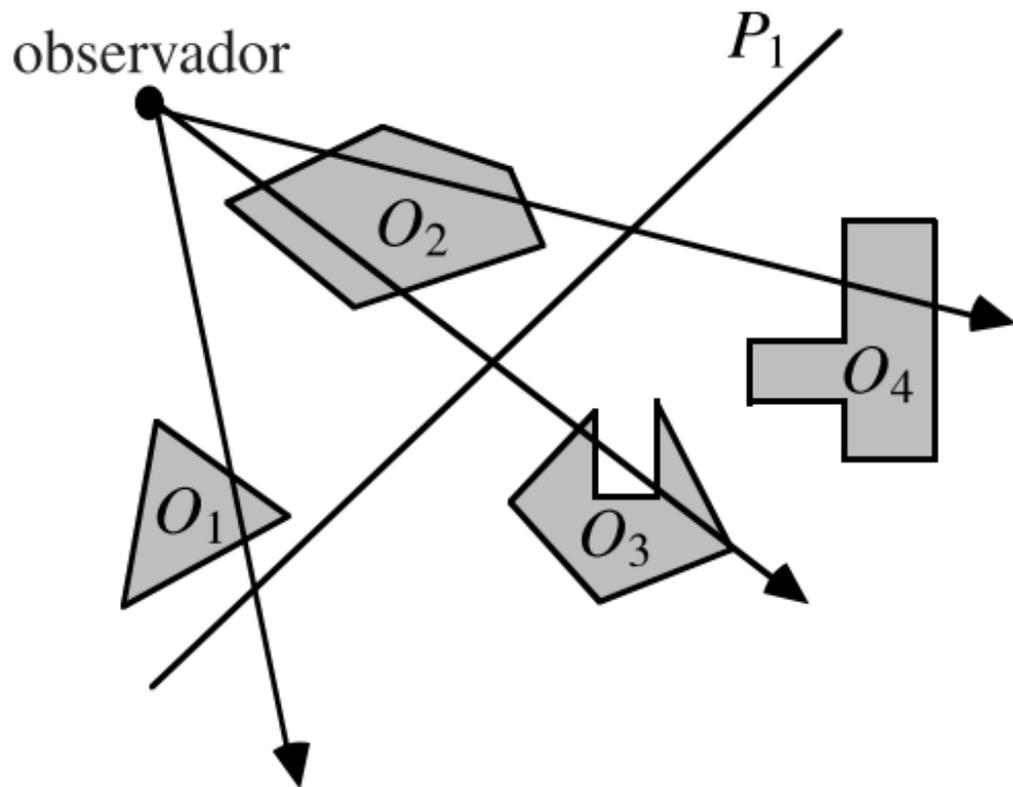


Figura 27. Propriedades fundamentais da árvore de particionamento.

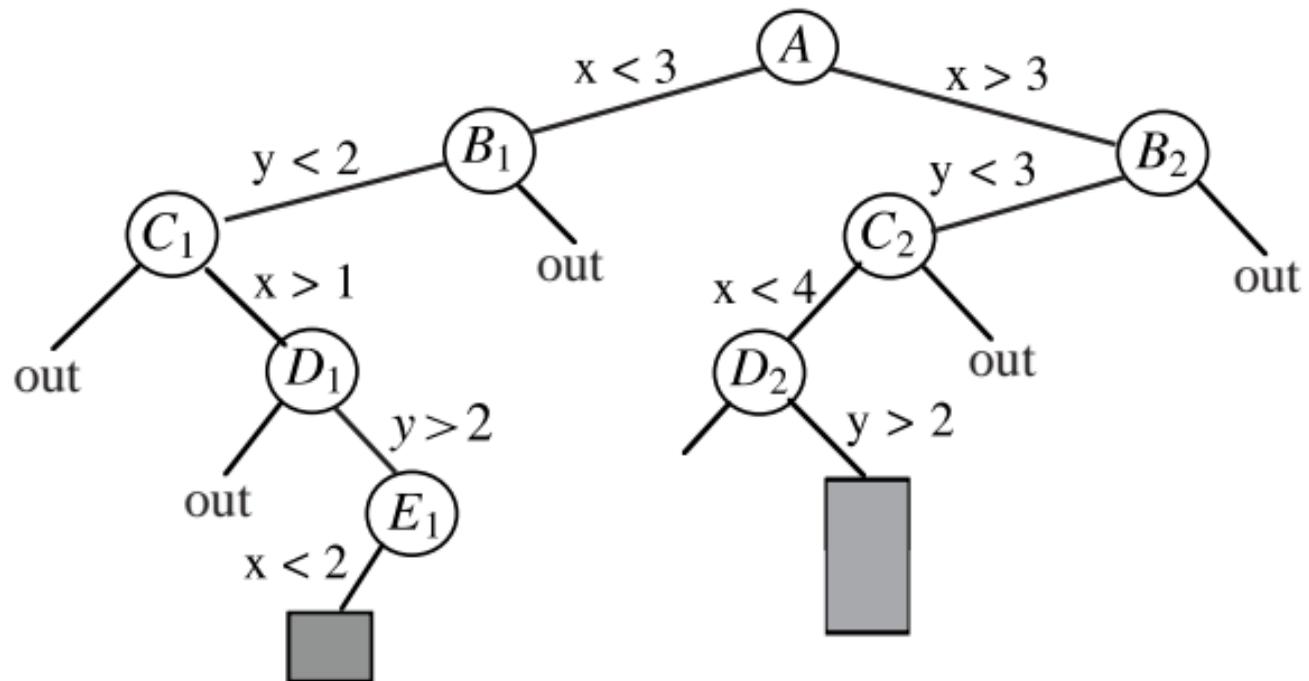
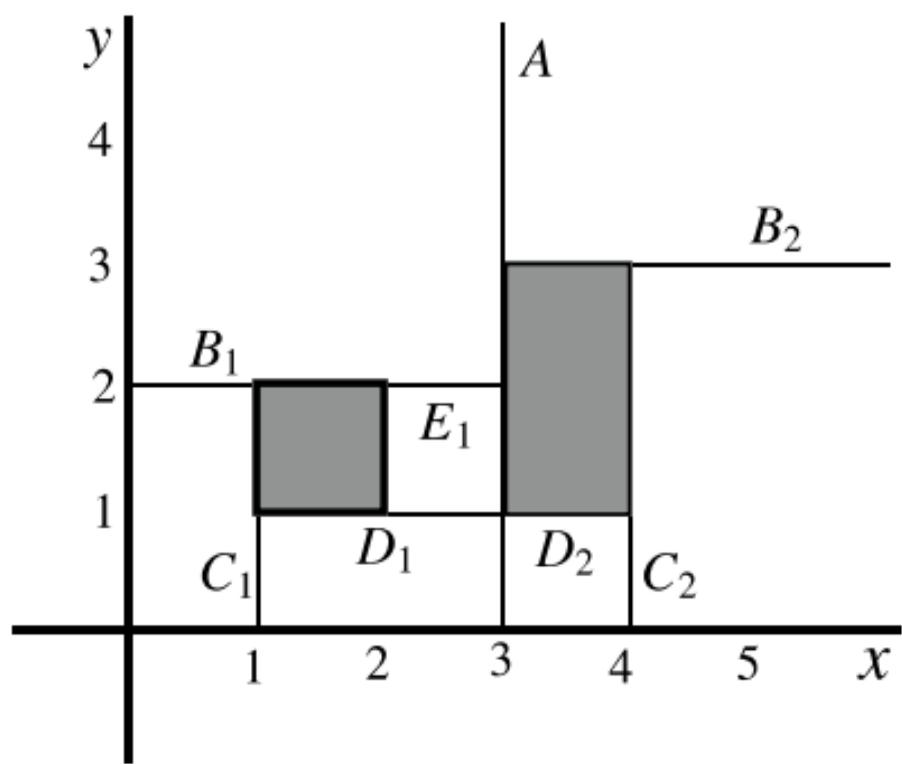


Figura 28. Árvore de busca.

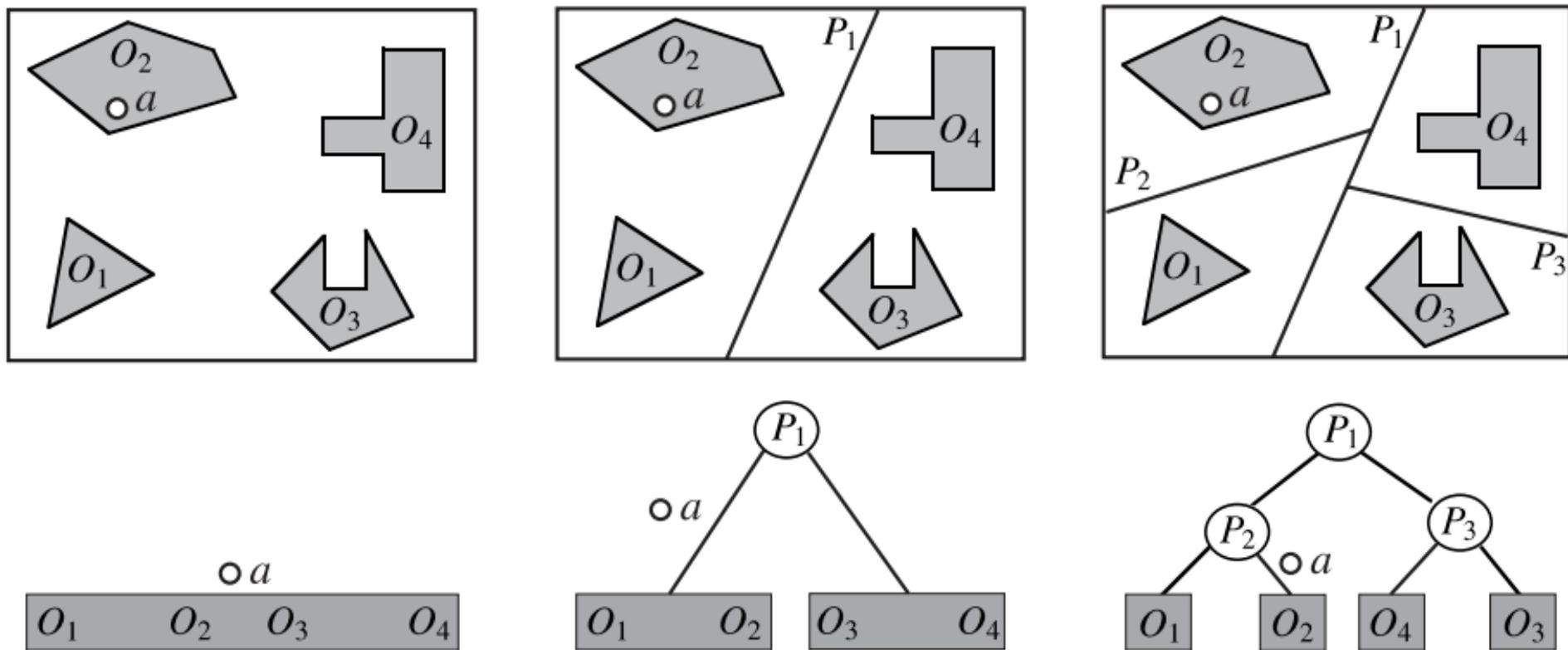


Figura 29. Problema de localização de pontos.

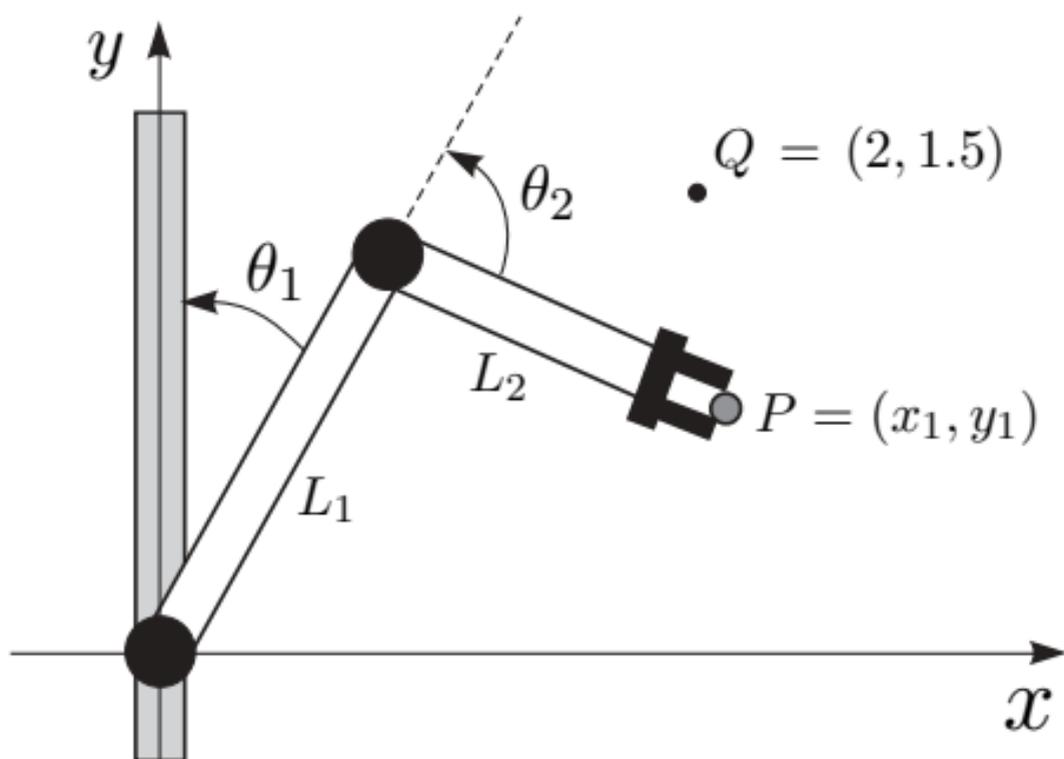


Figura 30.

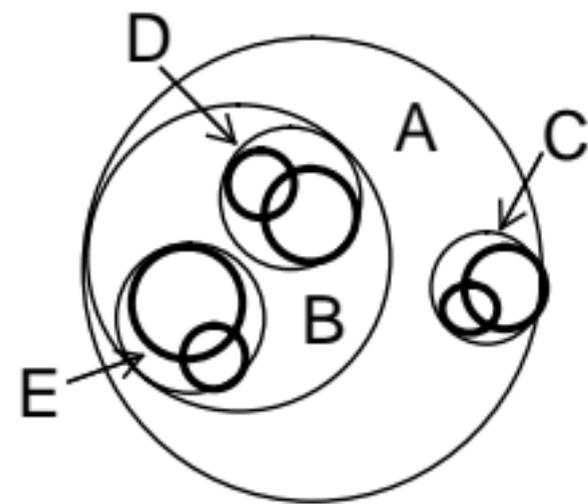
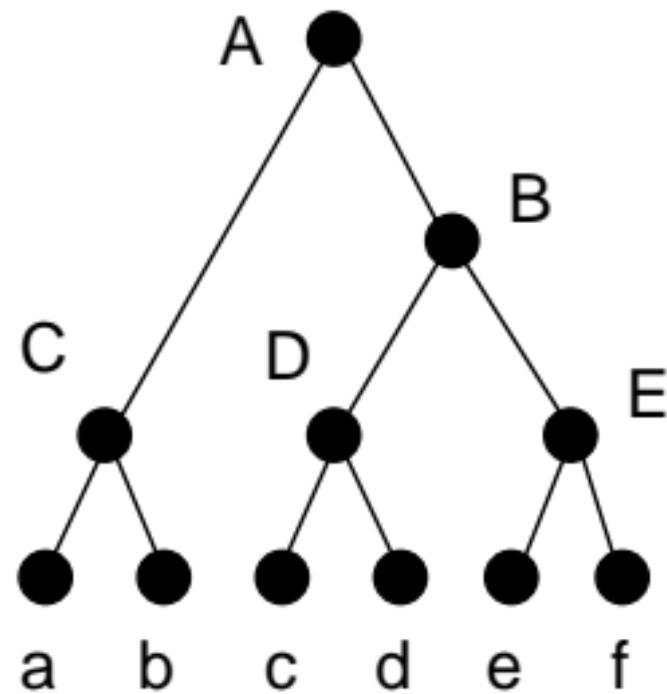
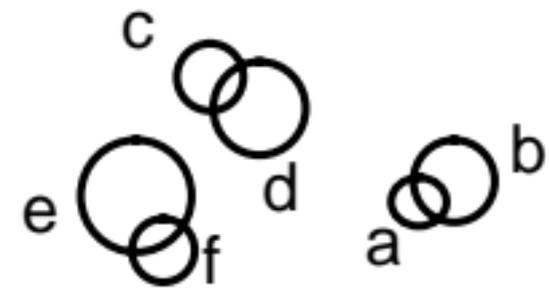


Figura 31.

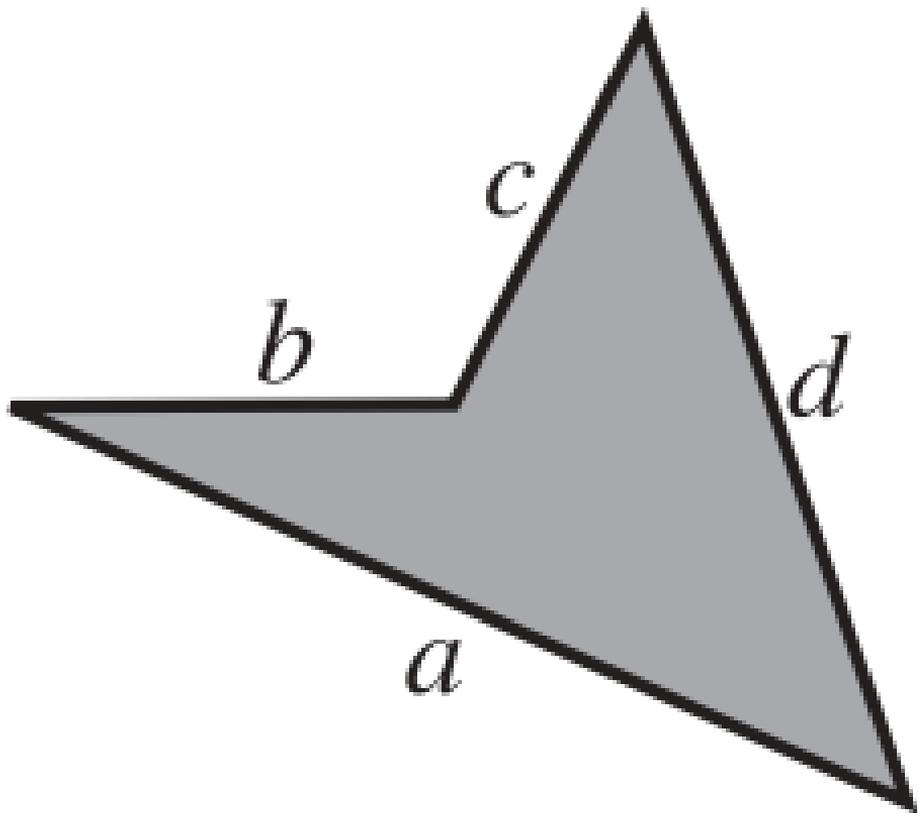


Figura 32.