4.13(Associativity)

(A ^ B) ^ C and A ^ (B ^ C)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| A | B | C | A ^ B | B ^ C | (A ^ B) ^ C | A ^ (B ^ C) | ((A ^ B) ^ C)⬄( A ^ (B ^ C)) |
| T | T | T | T | T | T | T | T |
| T | F | T | F | F | F | F | T |
| T | T | F | T | F | F | F | T |
| T | F | F | F | F | F | F | T |
| F | T | T | F | T | F | F | T |
| F | T | F | F | F | F | F | T |
| F | F | T | F | F | F | F | T |
| F | F | F | F | F | F | F | T |

4.22

Large(a)

Cube(a) v Dodec(a)

-----------

(Cube(a) ^ Large(a)) v (Dodec(a) ^ Large(a))

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Dodec(a) | Cube(a) | Large(a) | Cube(a)vDodec(a) | Cube(a)^Large(a)) | Dodec(a)^Large(a) | v |
| T | T | T | T | T | T | T |
| F | T | T | T | T | F | T |
| T | F | T | T | F | T | T |
| F | F | T | T | F | F | F |
| T | T | F | F | F | F | F |
| F | T | F | F | F | F | F |
| T | F | F | F | F | F | F |
| F | F | F | F | F | F | F |

4.33

(A ^ B) ^ A ⬄ A^(A^B) ⬄A^(B^A) ⬄ (A^A)^B⬄A^B

4.34

(B ^ (A ^ B ^ C)) ⬄(B^A^B)^C⬄(B^B^A)^C⬄(B^A)^C

4.35

(A V B) V (C ^ D) VA ⬄(A V B) V AV (C ^ D) ⬄( AV B V A) V (C ^ D)

⬄(A V B) V (C ^ D)

4.36

(~A V B) V (B V C) ⬄ ~A V B V B V C⬄~A V B V C