Questão 1:

a) E1 = ¬P → ((Q ^ P) v ¬P)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **P** | **Q** | **¬P** | **Q ^ P** | **((Q ^ P) v ¬P** | **¬P → ((Q ^ P) v ¬P)** |
| **T** | **T** | **F** | **T** | **T** | **T** |
| **T** | **F** | **F** | **F** | **F** | **T** |
| **F** | **T** | **T** | **F** | **T** | **T** |
| **F** | **F** | **T** | **F** | **T** | **T** |

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b) E2 = (Q → (P v ¬R) ) ↔︎ ¬ (¬Q v ¬(¬P ^ R))

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Q** | **P** | **R** | **¬P** | **¬R** | **¬Q** | **¬P ^ R** | **¬(¬P ^ R)** | **¬Q v ¬(¬P ^ R)** | **¬ (¬Q v ¬(¬P ^ R))** | **P v ¬R** | **Q → (P v ¬R)** | **E2** | **E2** |  |
| **T** | **T** | **T** | **F** | **F** | **F** | **F** | **T** | **T** | **F** | **T** | **T** | **F** |  |  |
| **T** | **T** | **F** | **F** | **T** | **F** | **F** | **T** | **T** | **F** | **T** | **T** | **F** |  |  |
| **T** | **F** | **T** | **T** | **F** | **F** | **T** | **F** | **F** | **T** | **F** | **F** | **F** |  |  |
| **T** | **F** | **F** | **T** | **T** | **F** | **F** | **T** | **T** | **F** | **T** | **T** | **F** |  |  |
| **F** | **T** | **T** | **F** | **F** | **T** | **F** | **T** | **T** | **F** | **T** | **T** | **F** |  |  |
| **F** | **T** | **F** | **F** | **T** | **T** | **F** | **T** | **T** | **F** | **T** | **T** | **F** |  |  |
| **F** | **F** | **T** | **T** | **F** | **T** | **T** | **F** | **T** | **F** | **F** | **T** | **F** |  |  |
| **F** | **F** | **F** | **T** | **T** | **T** | **F** | **F** | **T** | **F** | **T** | **T** | **F** |  |  |

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c) E3 = (¬P ^ Q ) → (P → ¬ Q)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **P** | **Q** | **¬ Q** | **¬P** | **P → ¬ Q** | **¬P ^ Q** | **(¬P ^ Q ) → (P → ¬ Q)** |
| **T** | **T** | **F** | **F** | **F** | **F** | **T** |
| **T** | **F** | **T** | **F** | **T** | **F** | **T** |
| **F** | **T** | **F** | **T** | **T** | **T** | **T** |
| **F** | **F** | **T** | **T** | **T** | **F** | **T** |

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Questão 02: Dada as fórmulas H e G em cada item, diga se H |= G e se G |= H

a) H = ¬P → ((Q ^ P) v ¬P) e G = (¬P ^ Q ) → (P → ¬ Q)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **P** | **Q** | **¬P** | **Q ^ P** | **(Q ^ P) v ¬P** | **H** |
| **T** | **T** | **F** | **T** | **T** | **T** |
| **T** | **F** | **F** | **F** | **F** | **T** |
| **F** | **T** | **T** | **F** | **T** | **T** |
| **F** | **F** | **T** | **F** | **T** | **T** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **P** | **Q** | **¬P** | **¬ Q** | **P → ¬ Q** | **¬P ^ Q** | **G** |
| **T** | **T** | **F** | **F** | **F** | **F** | **T** |
| **T** | **F** | **F** | **T** | **T** | **F** | **T** |
| **F** | **T** | **T** | **F** | **T** | **T** | **T** |
| **F** | **F** | **T** | **T** | **T** | **F** | **T** |

|  |  |
| --- | --- |
| **H** | **G** |
| **T** | **T** |
| **T** | **T** |
| **T** | **T** |
| **T** | **T** |

H |= G? Sim, todas interpretações de H=T implicam em G.

G |= H? Sim, todas interpretações de G=T implicam em H.

b) H = Q → (¬P v R) e. G = ¬ (¬Q v ¬(P ^ ¬R))

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Q** | **P** | **R** | **¬P** | **¬P v R** | **H** |
| **T** | **T** | **T** | **F** | **T** | **T** |
| **T** | **T** | **F** | **F** | **F** | **F** |
| **T** | **F** | **T** | **T** | **T** | **T** |
| **T** | **F** | **F** | **T** | **T** | **T** |
| **F** | **T** | **T** | **F** | **T** | **T** |
| **F** | **T** | **F** | **F** | **F** | **T** |
| **F** | **F** | **T** | **T** | **T** | **T** |
| **F** | **F** | **F** | **T** | **T** | **T** |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Q** | **P** | **R** | **¬Q** | **¬R** | **P ^ ¬R** | **¬(P ^ ¬R)** | **(¬Q v ¬(P ^ ¬R))** | **G** |
| **T** | **T** | **T** | **F** | **F** | **F** | **T** | **T** | **F** |
| **T** | **T** | **F** | **F** | **T** | **T** | **F** | **F** | **T** |
| **T** | **F** | **T** | **F** | **F** | **F** | **T** | **T** | **F** |
| **T** | **F** | **F** | **F** | **T** | **F** | **T** | **T** | **F** |
| **F** | **T** | **T** | **T** | **F** | **F** | **T** | **T** | **F** |
| **F** | **T** | **F** | **T** | **T** | **T** | **F** | **T** | **F** |
| **F** | **F** | **T** | **T** | **F** | **F** | **T** | **T** | **F** |
| **F** | **F** | **F** | **T** | **T** | **F** | **T** | **T** | **F** |

|  |  |
| --- | --- |
| **H** | **G** |
| **T** | **F** |
| **F** | **T** |
| **T** | **F** |
| **T** | **F** |
| **T** | **F** |
| **T** | **F** |
| **T** | **F** |
| **T** | **F** |

H |= G? Não, todas as interpretações de H=T não implicam em G.

G |= H? Não, todas as interpretações de G=T não implicam em H.