3.17.1. Alternative Connective Problems

A. We noted that a "%" sentence entails its left part and the negation of its part – so that, for example, each of the following arguments is valid.

1. (Q % P)	1. (Q % P)
∴ Q	∴ ~P

For each of the above arguments, state that **argument's connective dual** – using the definition of "dual of an argument" set out in 3.34 §1.

> The (connective) **dual of an argument** is the result of (i) switching the conclusion and the premise(s) of that argument, then (ii) replacing each sentence with its (connective) dual. (If the argument has more than one premise, these premises are conjoined together before Step (i).)

B. In 3.10 §2 it was noted that the **vel distributes over** the **wedge**, and vice versa. That is: the following arguments are **both valid**.

1. (P ∨ (Q ∧ R))	1. (P ∧ (Q ∨ R))
∴ ((P ∨ Q) ∧ (P ∨ R))	∴ ((P ∧ Q) ∨ (P ∧ R))

1. Does the **vel distribute over** the **wo**? Does the **wedge distribute over** the **wo**? That is: is the following argument valid?

1. (P ∨ (Q **%** R))	1. (P ∧ (Q **%** R))
∴ ((P ∨ Q) **%** (P ∨ R))	∴ ((P ∧ Q) **%** (P ∧ R))

2. Does the **vel distribute over** the **exor**? Does the **wedge distribute over** the **exor**? (That is: which of the following arguments, if any, is valid?)

1. $(\underline{P \vee} (Q \oplus R))$	1. $(\underline{P \wedge} (Q \oplus R))$
$\therefore ((\underline{P \vee} Q) \oplus (\underline{P \vee} R))$	$\therefore ((\underline{P \wedge} Q) \oplus (\underline{P \wedge} R))$