**Christoph Weidenbach**                                                    **May 9, 2017**

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**Tutorials for "Automated Reasoning II"**
**Exercise sheet 3**

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**Exercise 3.1:** ( *P*)
Eliminate $x_2$ in

$$\exists x_1, x_2, x_3 \, (3x_1 + 4x_2 - 1 > 0 \wedge -x_1 + x_2 + 1 \geq 0 \wedge 2x_2 - x_3 \approx 0)$$

by virtual substitution.

**Exercise 3.2:** ( *P*)
Eliminate $x_1, x_2, x_3$ in

$$\exists x_1, x_2, x_3 \, (-x_1 + x_2 + 1 \geq 0 \wedge -x_2 - x_3 \geq 0 \wedge x_1 + x_3 - 2 \geq 0)$$

by virtual substitution.

**Exercise 3.3:** ( *P*)
Eliminate all variables in
$$\exists x. \forall y. (x + 3y < 7 \vee 3x + 3y \geq 7)$$

by virtual substitution.