March 19, Week 9

Today: Chapter 7, Energy

Homework #6: Mastering Physics: 9 problems from chapters 5 and 6
Written: None.
Due Wednesday at 11:59pm

Exam #3 in mailboxes. If your exam is not there, please come see me.

Make-up exam question (worth an additional 5% points) due Wednesday at the beginning of lecture.

Review

For constant force and straight-line displacement:

$$\boxed{W = \overrightarrow{\mathbf{F}} \cdot \overrightarrow{\mathbf{s}} = Fs\cos\phi}$$

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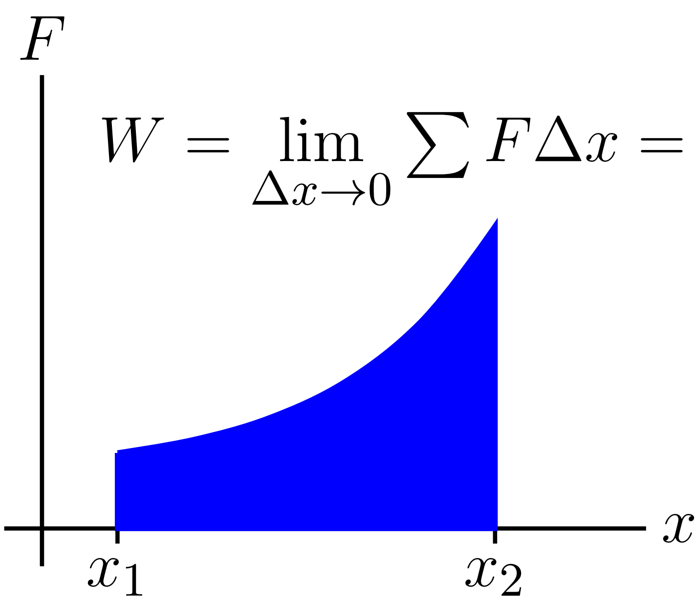

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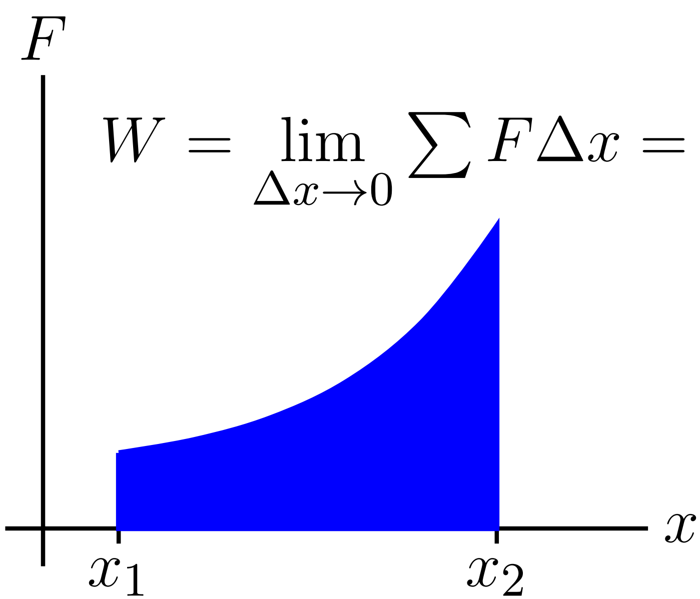

In either case,

the work-energy theorem holds:

$$W_{total} = \Delta K = \tfrac{1}{2} M v_2^2 - \tfrac{1}{2} M v_1^2$$

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$$\boxed{1\, hp = 550\, lb \cdot ft/s = 746\, Watt}$$

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Conservative Forces - Forces that create potential energy.

Conservative forces are rare. Only gravity and the spring force are conservative. (You'll learn two more next term - the electric and magnetic force.) For a force to be conservative, the work it does must be independent of path.

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Conservation of Energy - If only conservative forces do work on an object, its total energy cannot change.

Total Energy, E = the sum of kinetic and potential energy.

$$\boxed{E = K + U}$$

Conservation of Energy II

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$$K_1 + U_1 = K_2 + U_2 \Rightarrow E_1 = E_2$$

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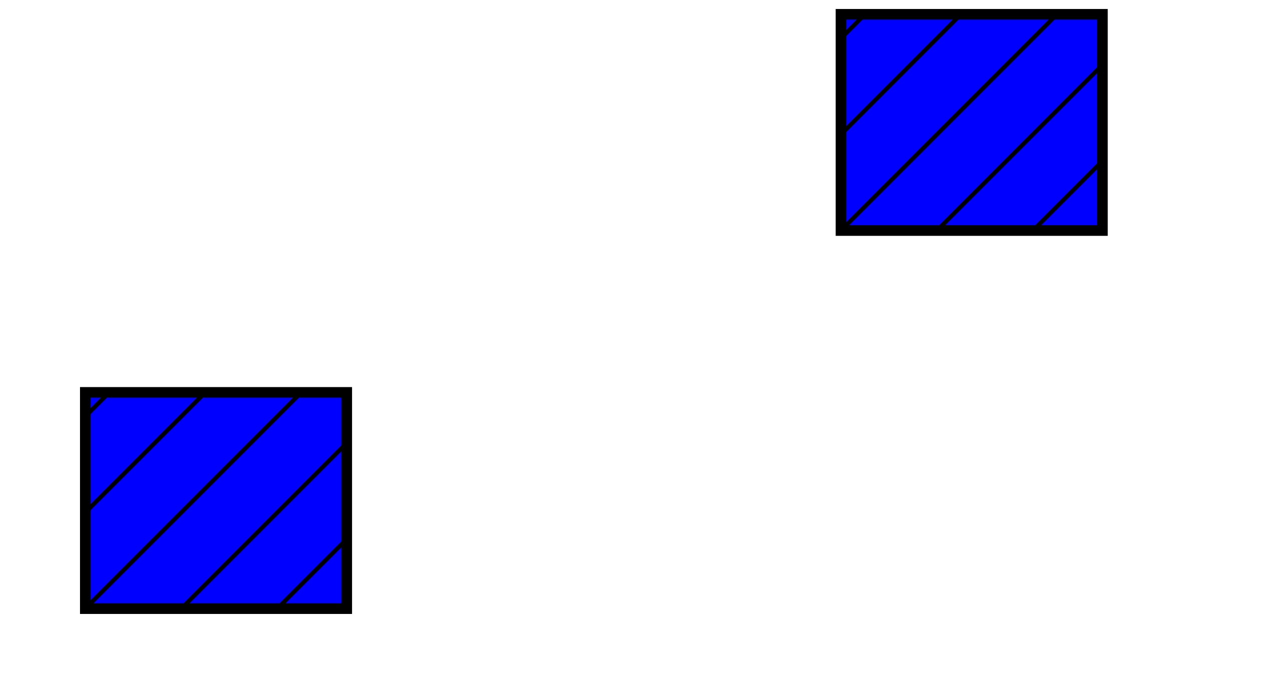

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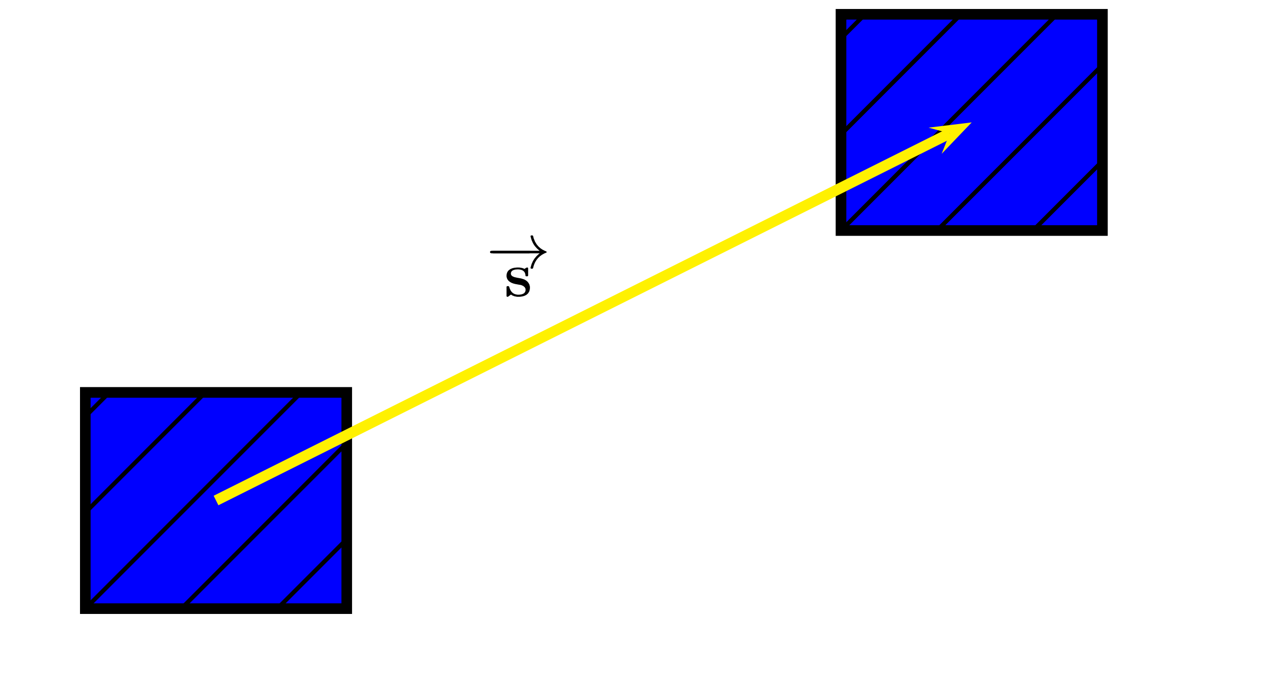

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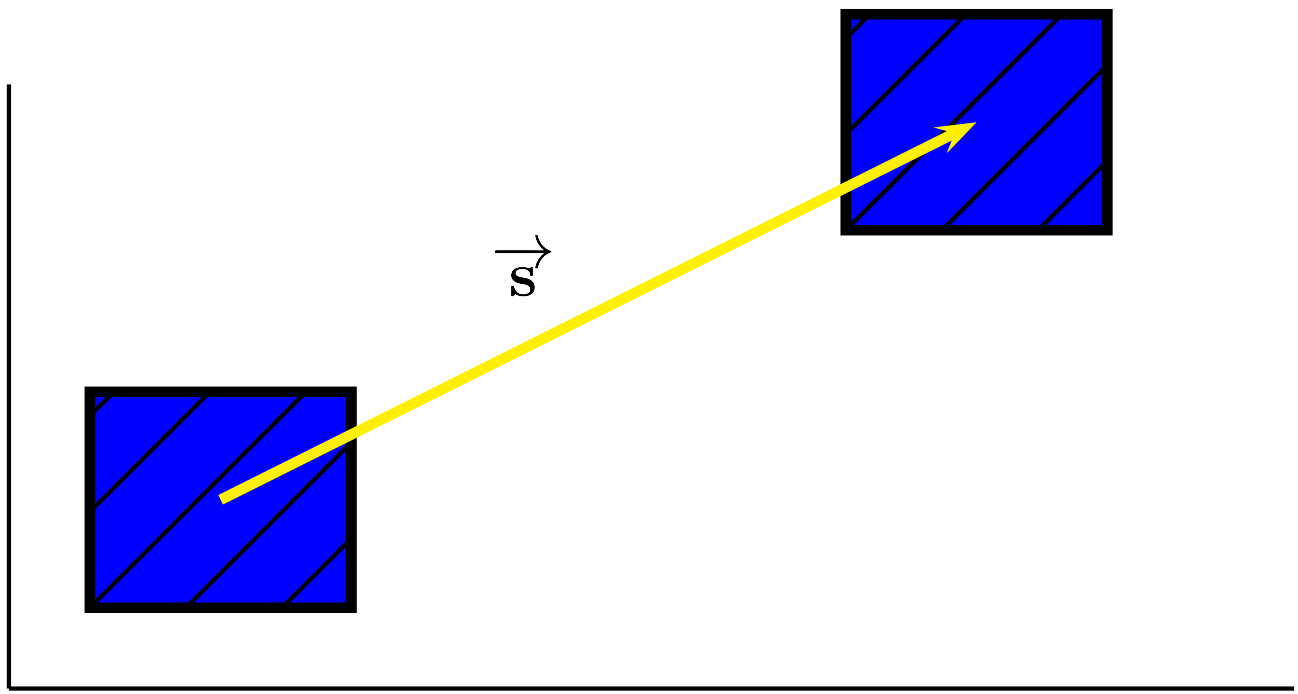

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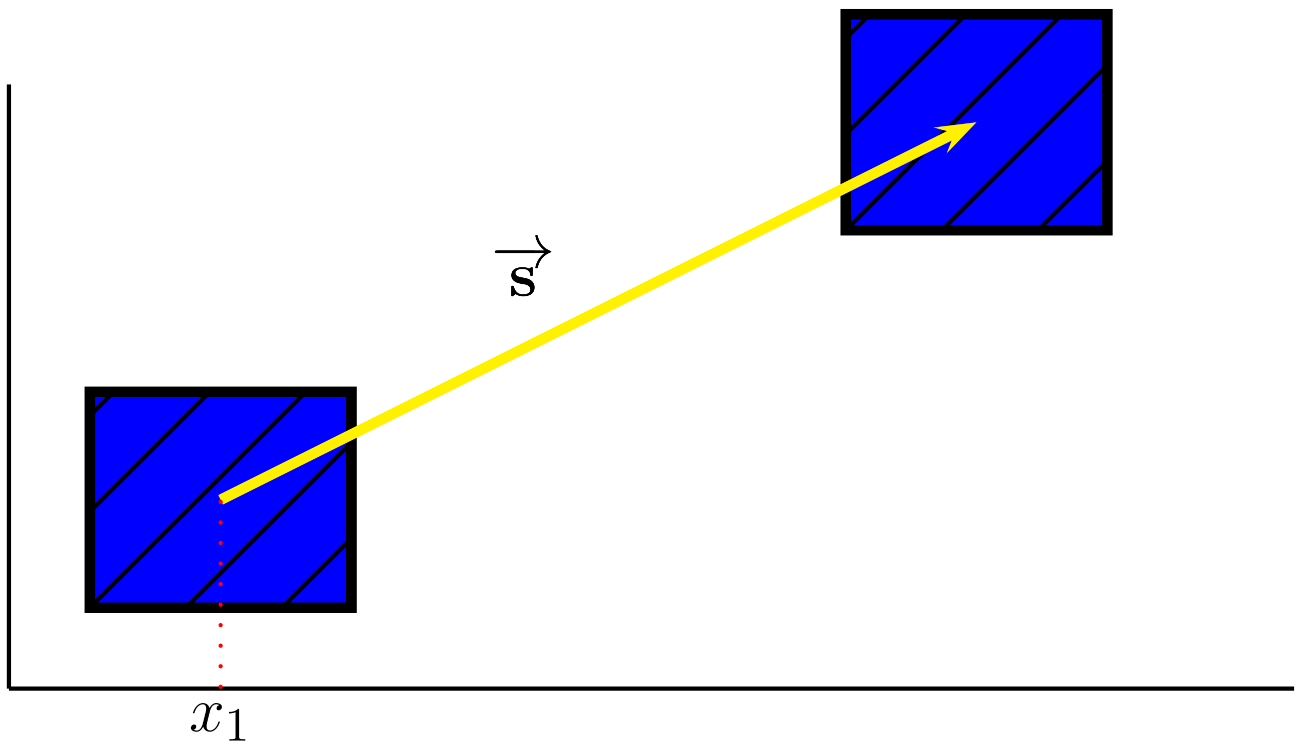

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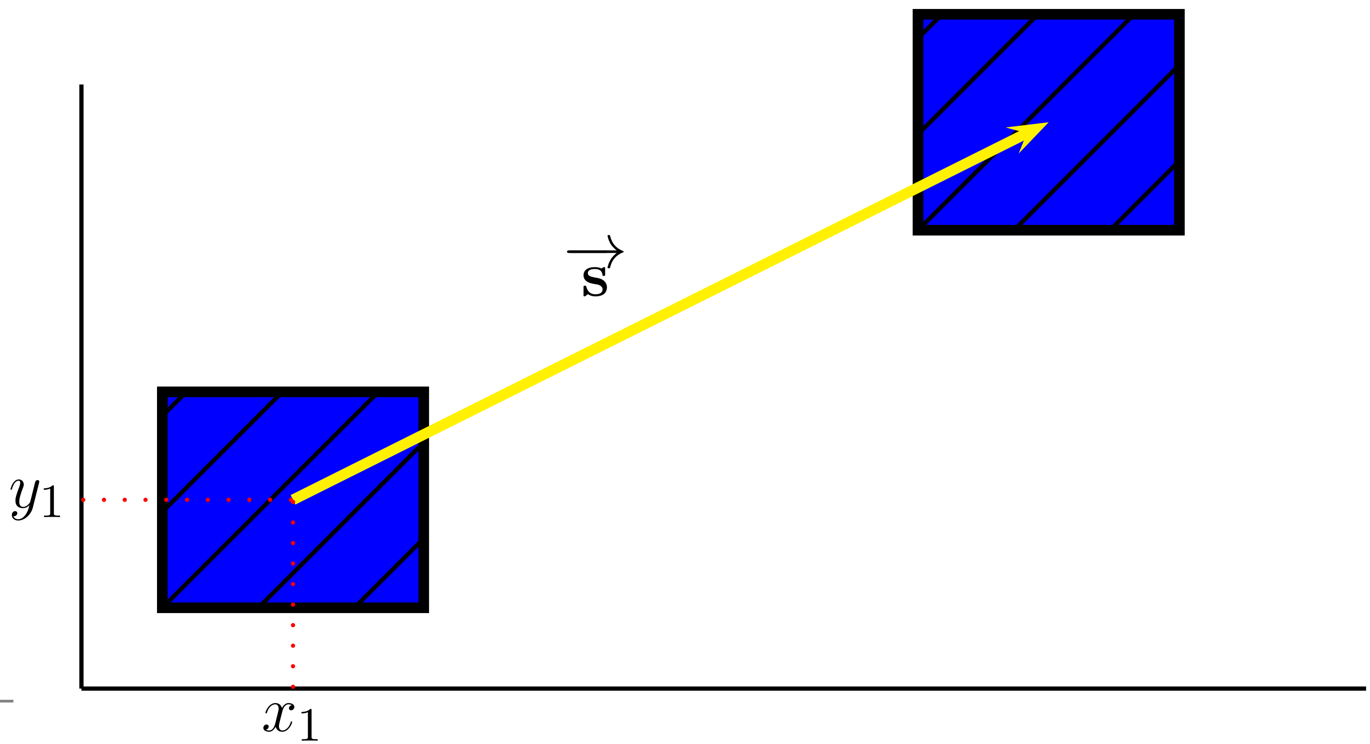

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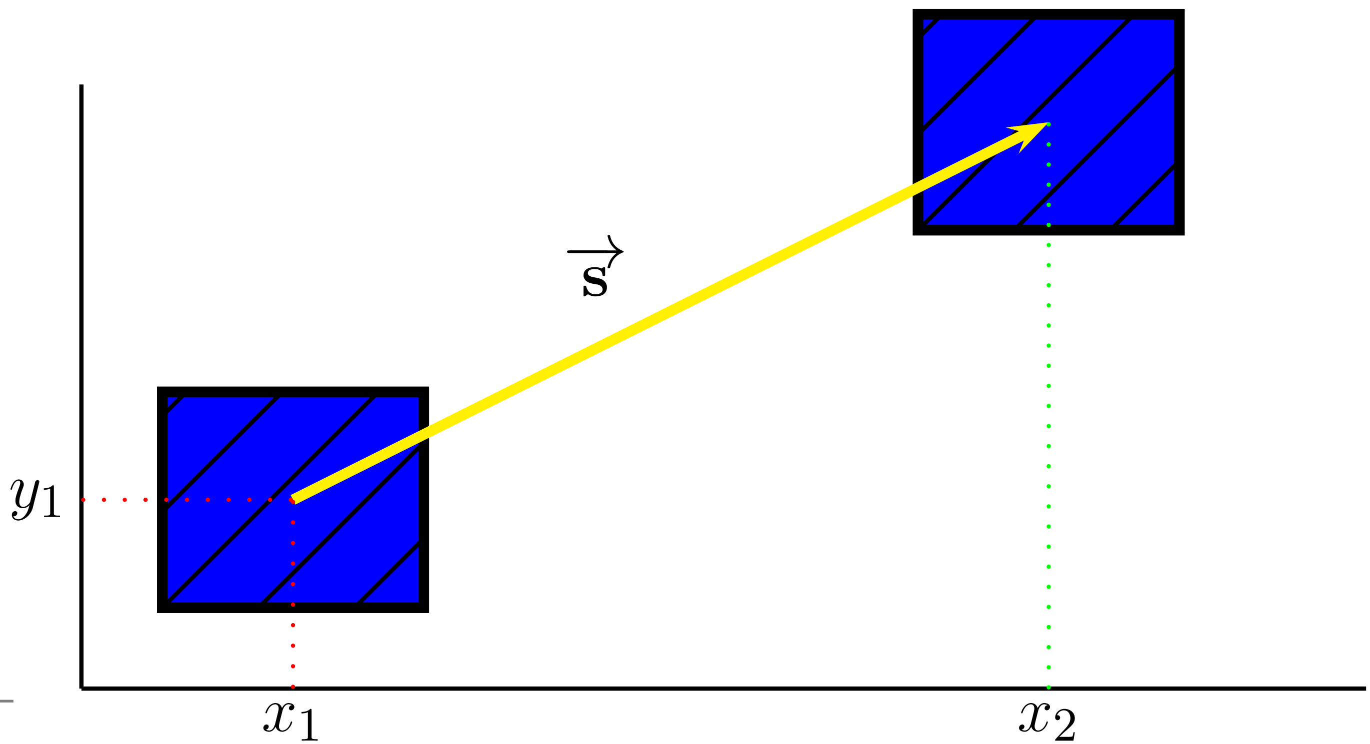

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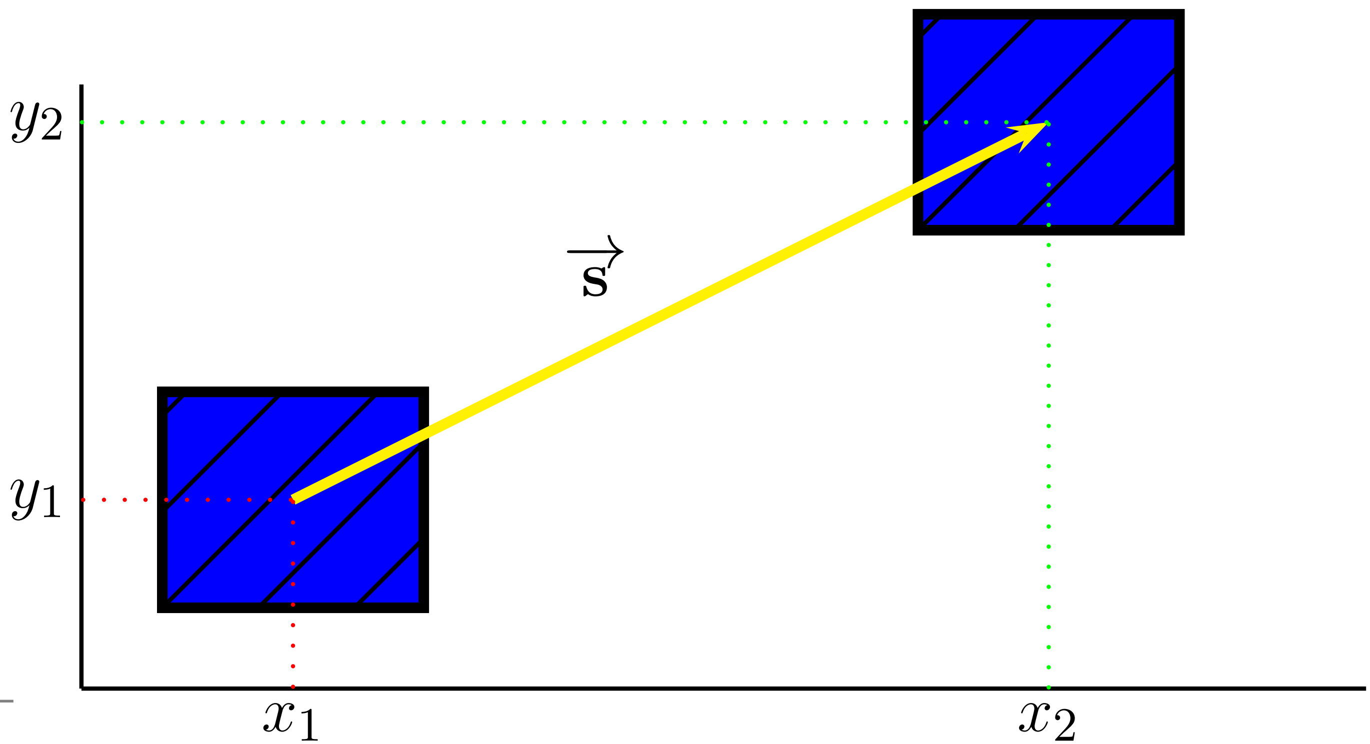

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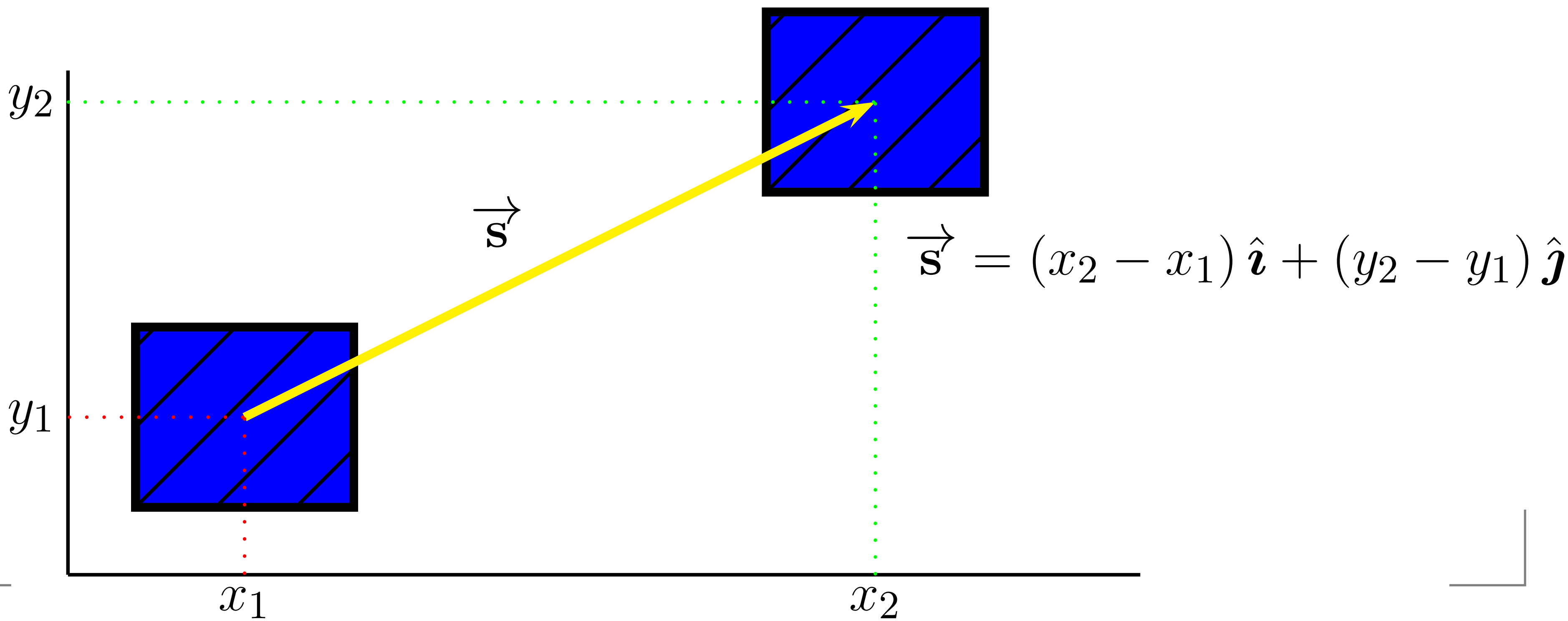

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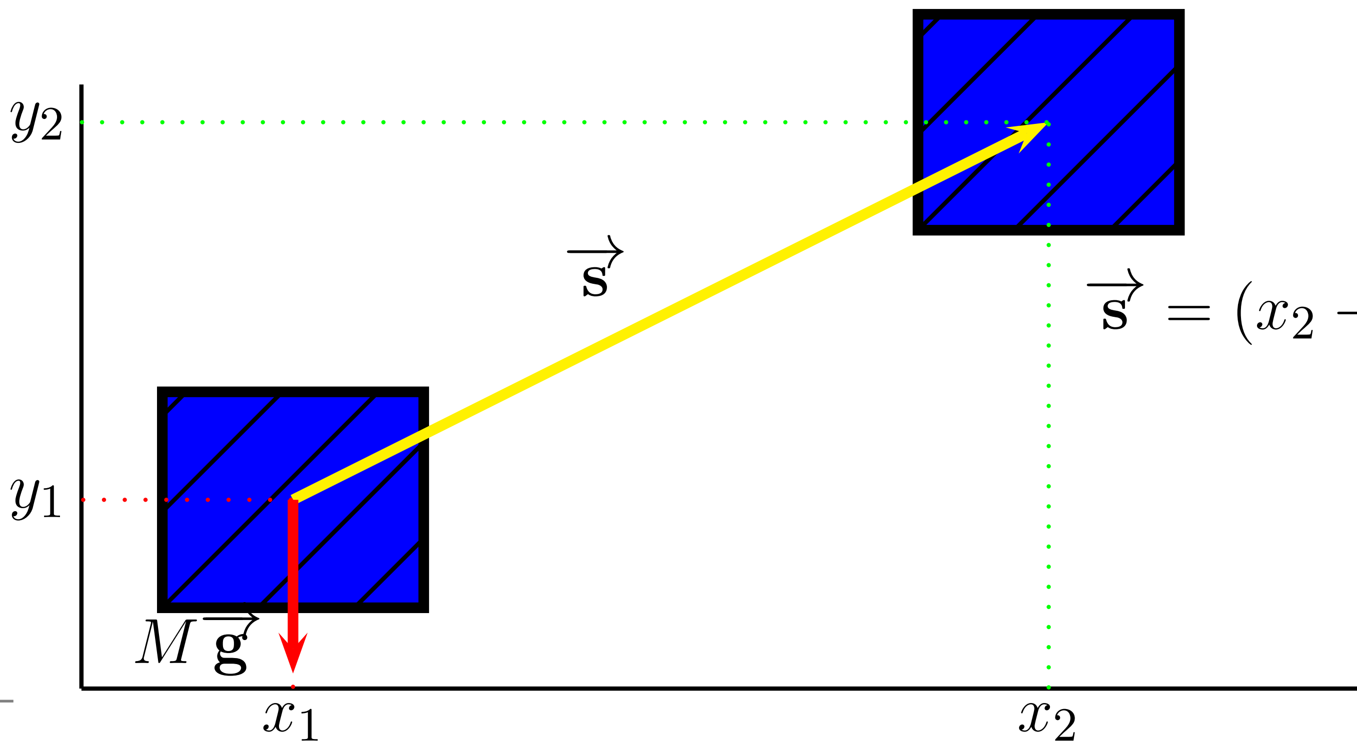

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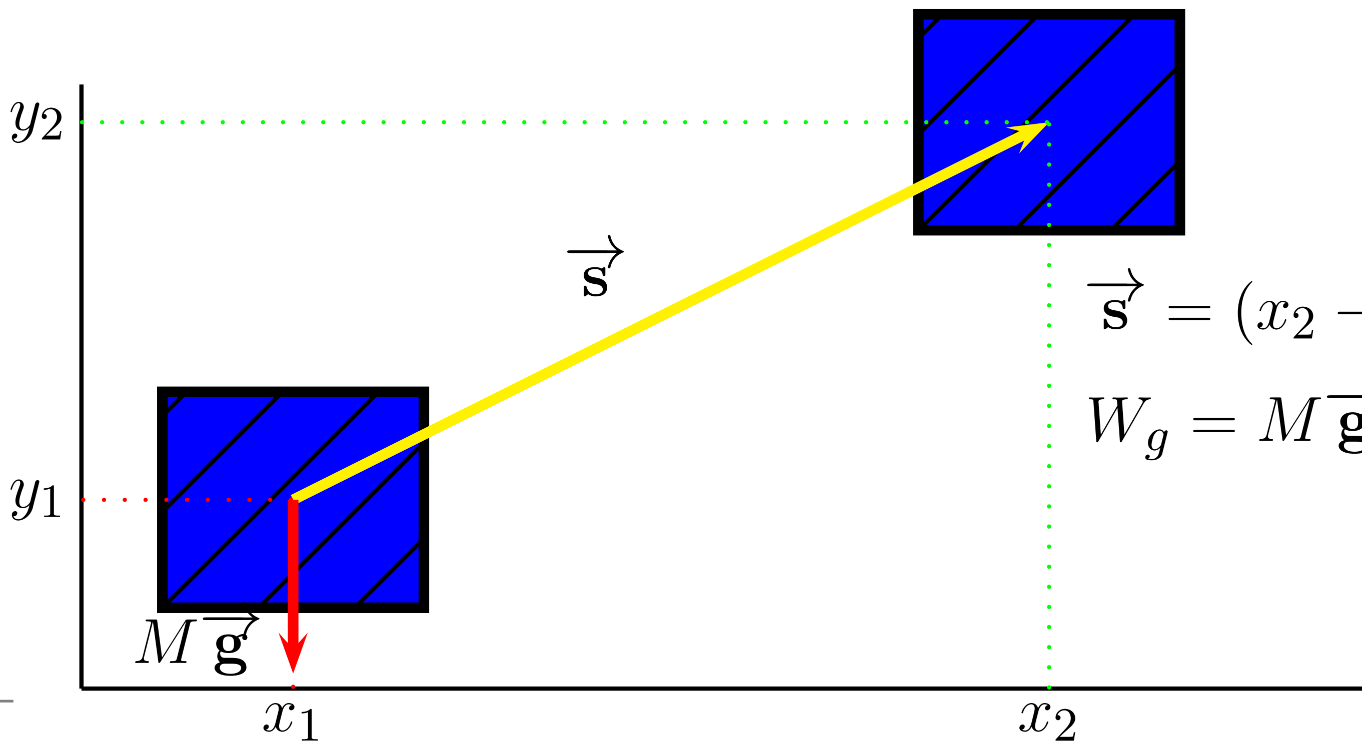

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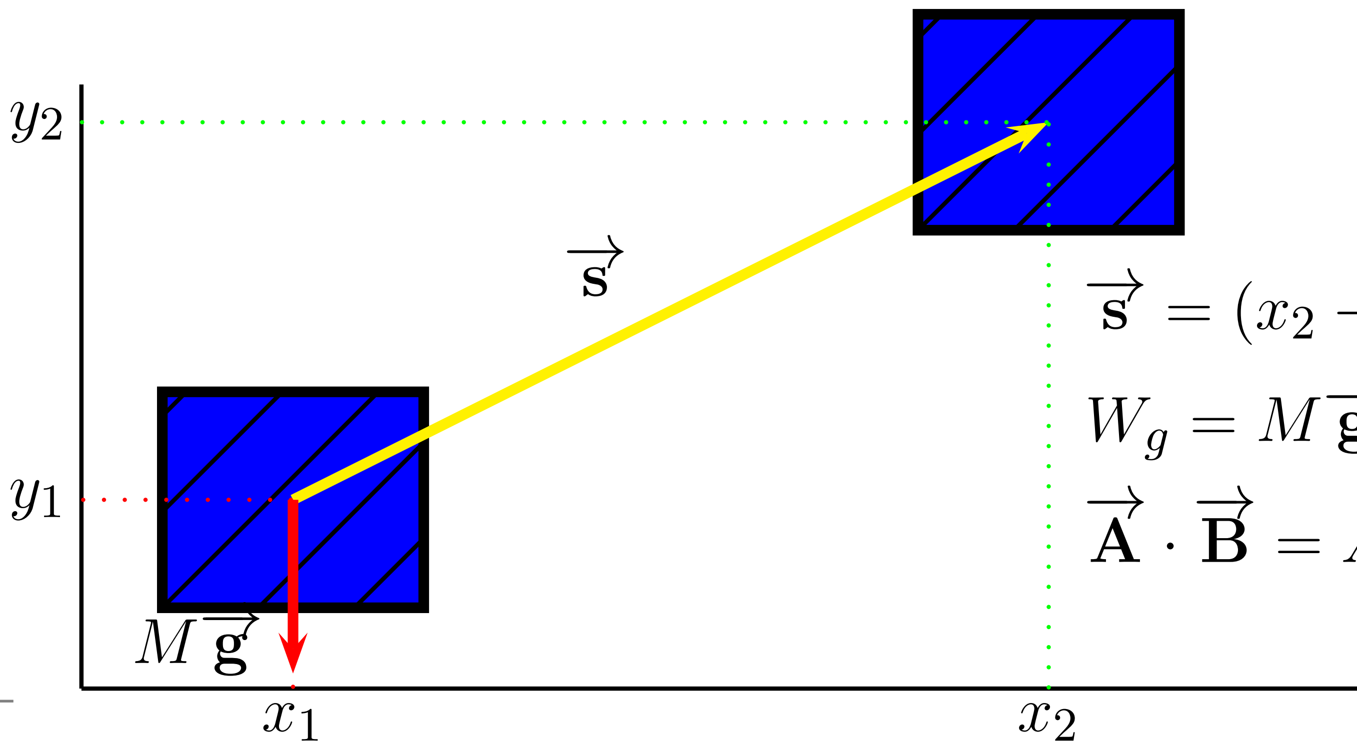

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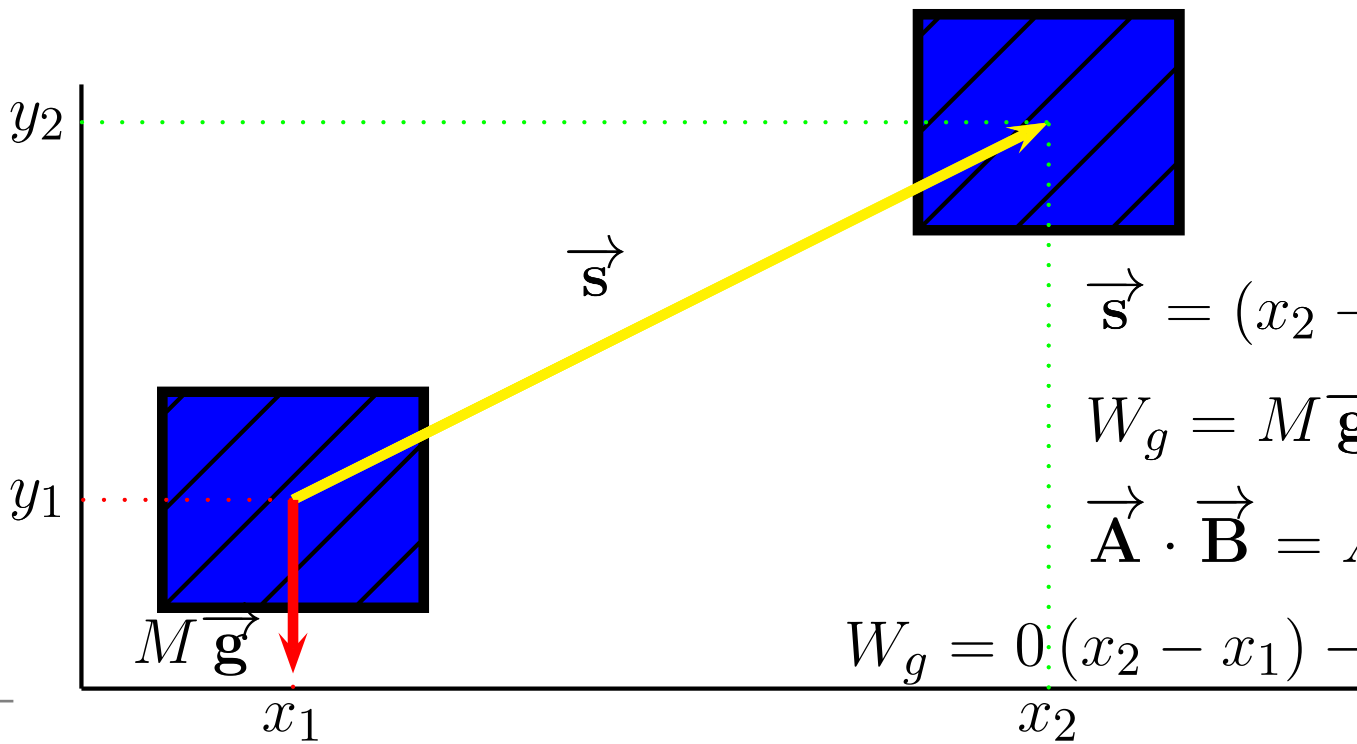

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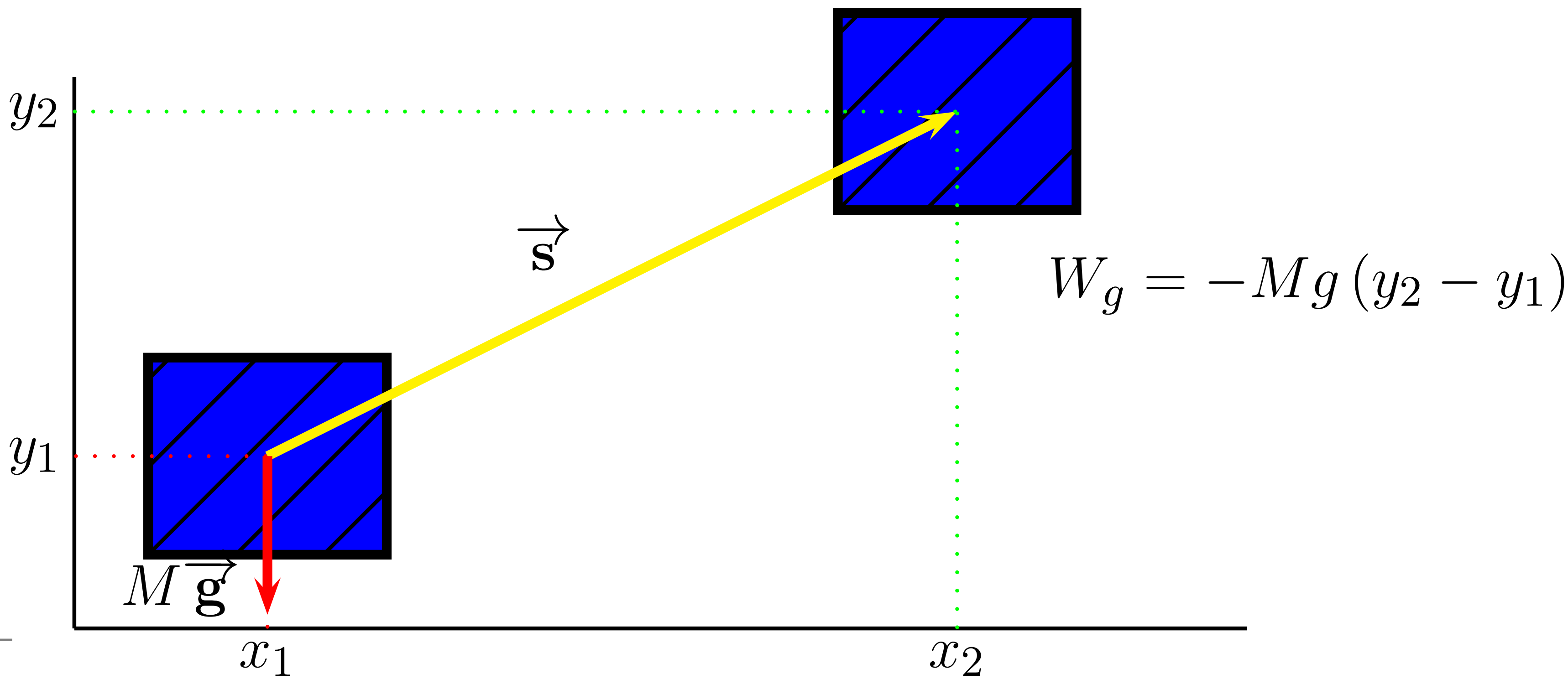

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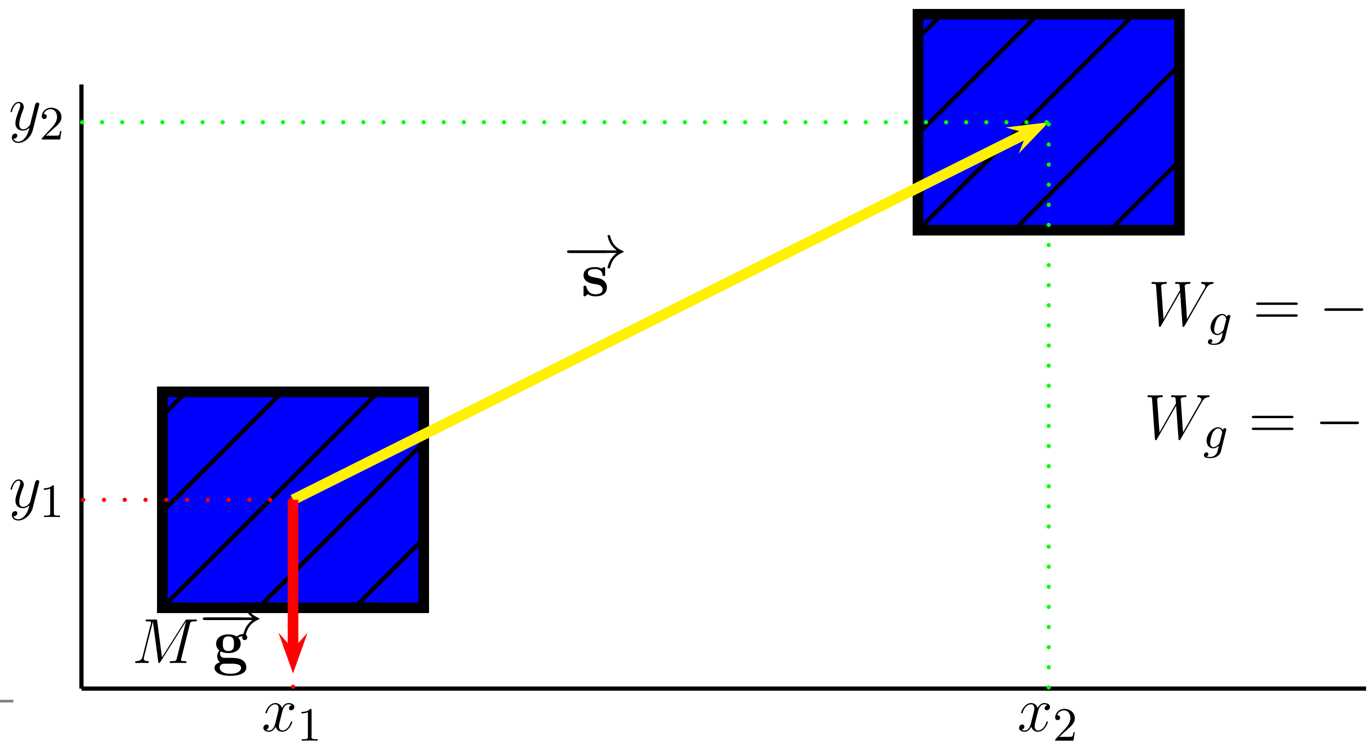

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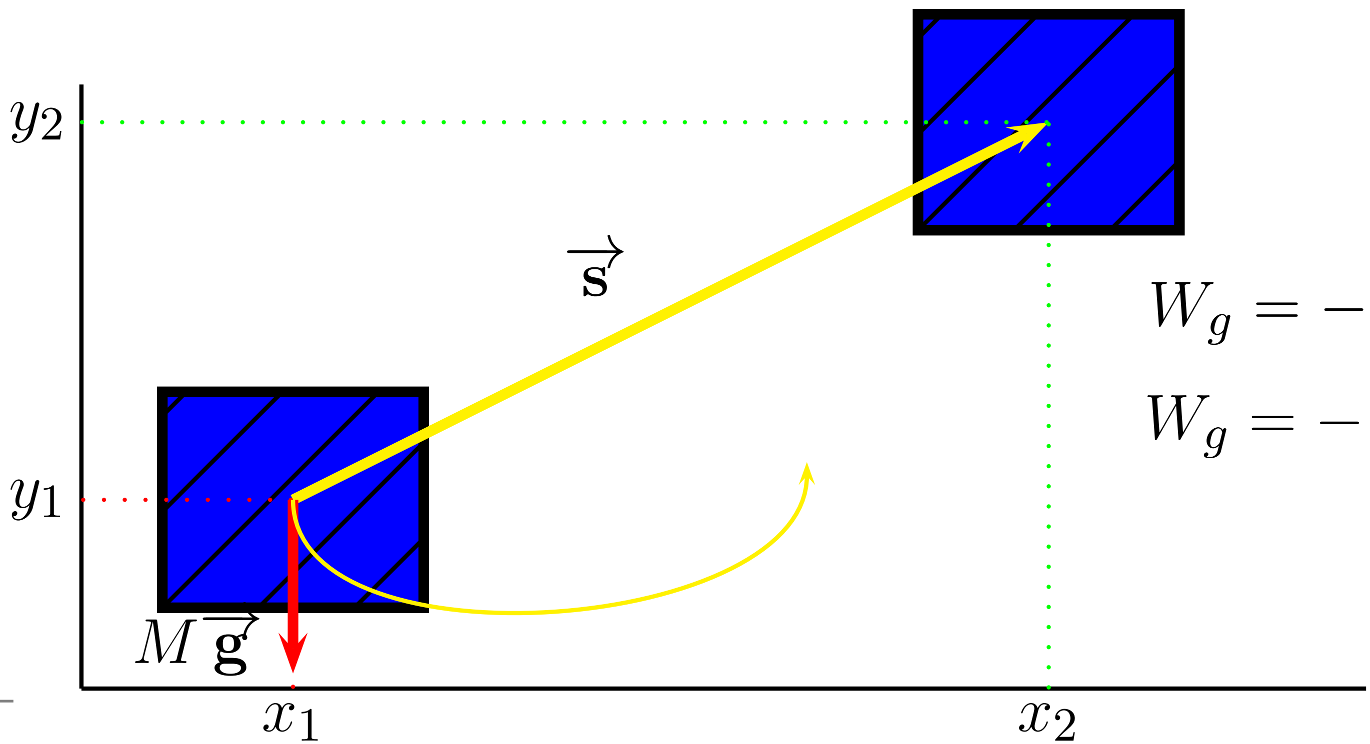

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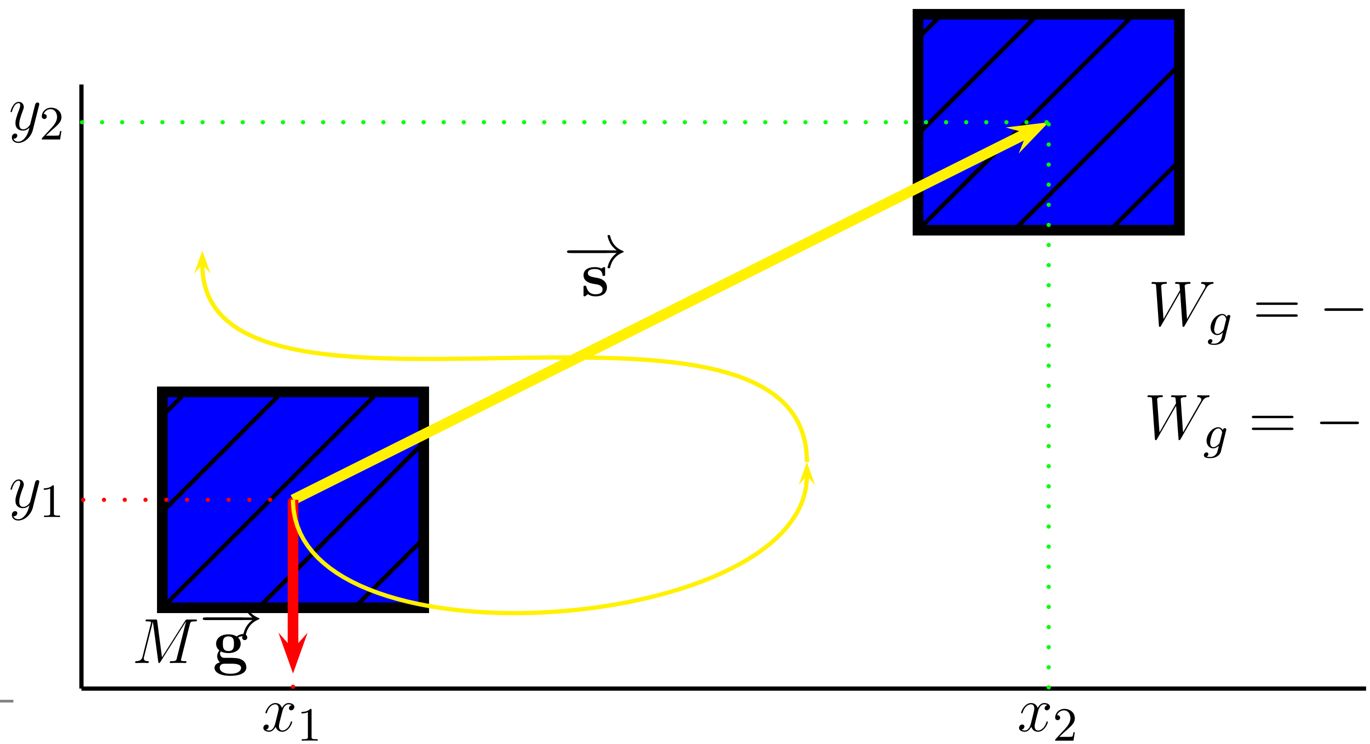

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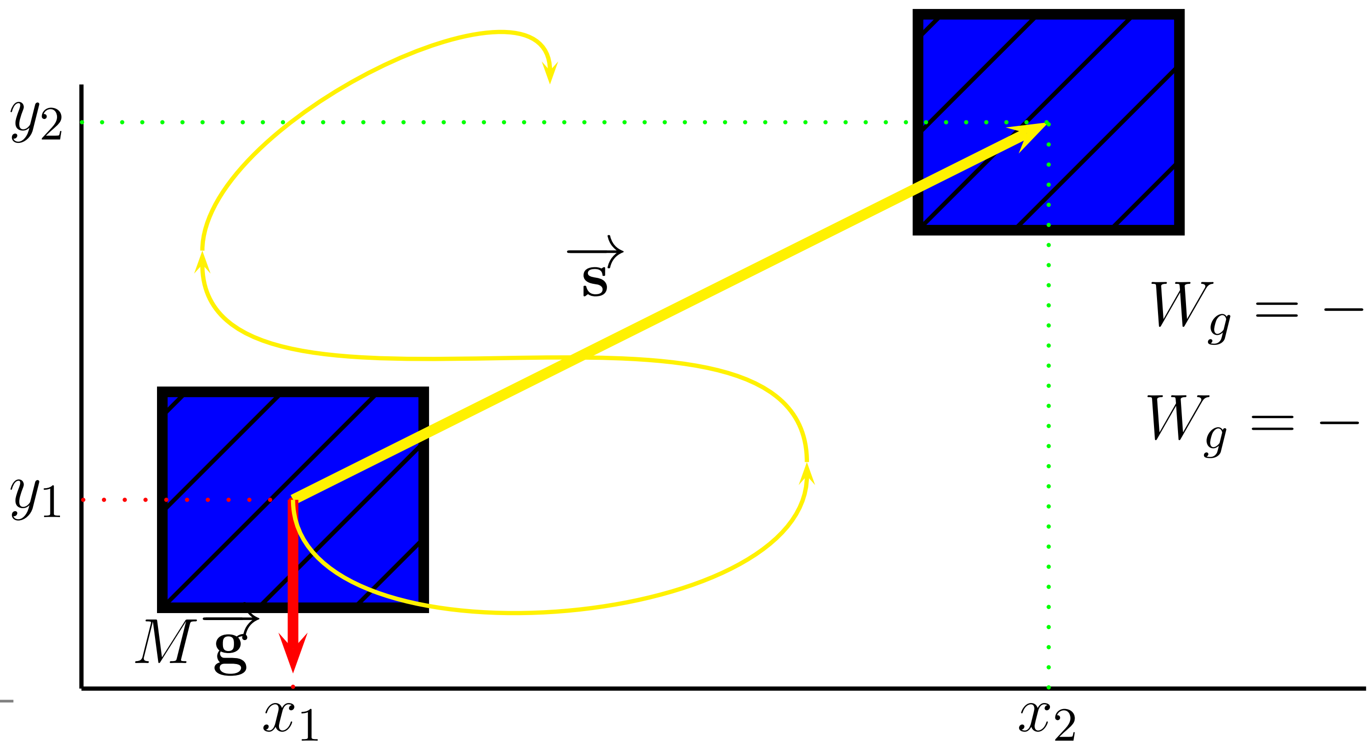

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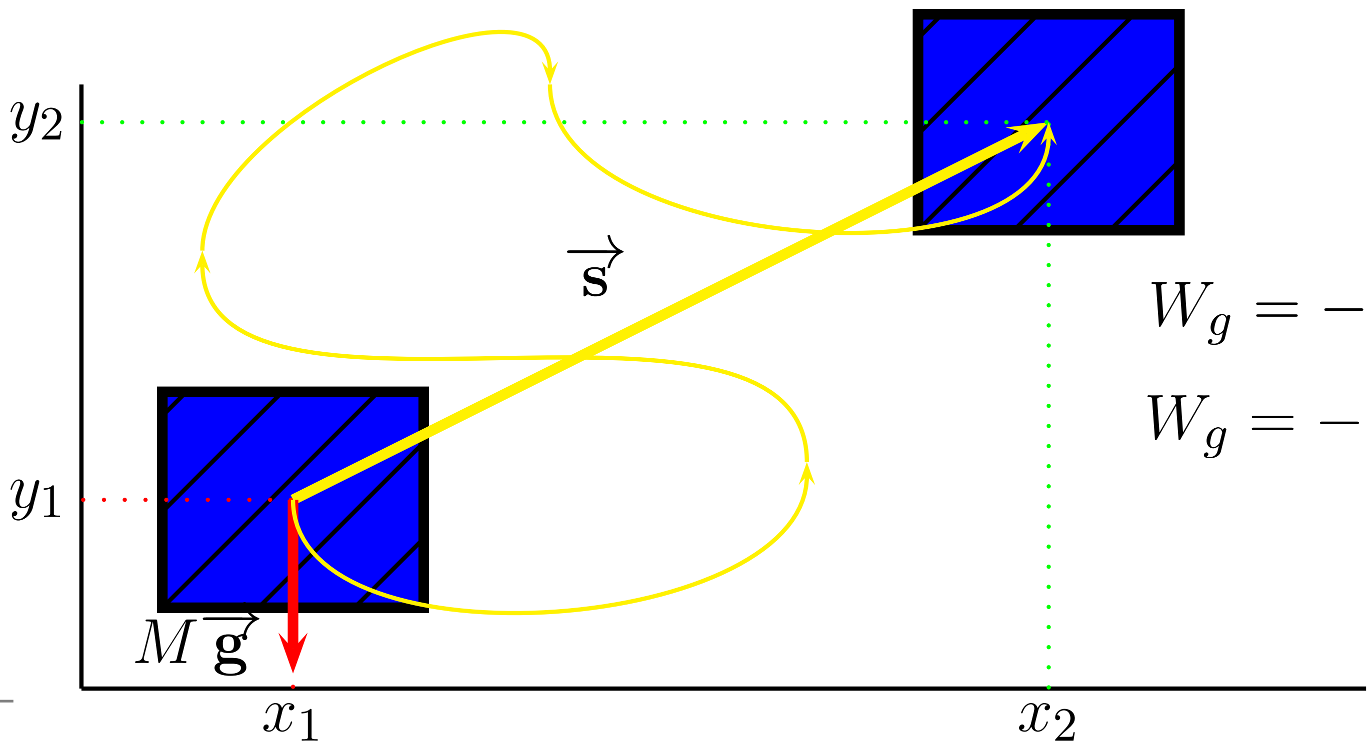

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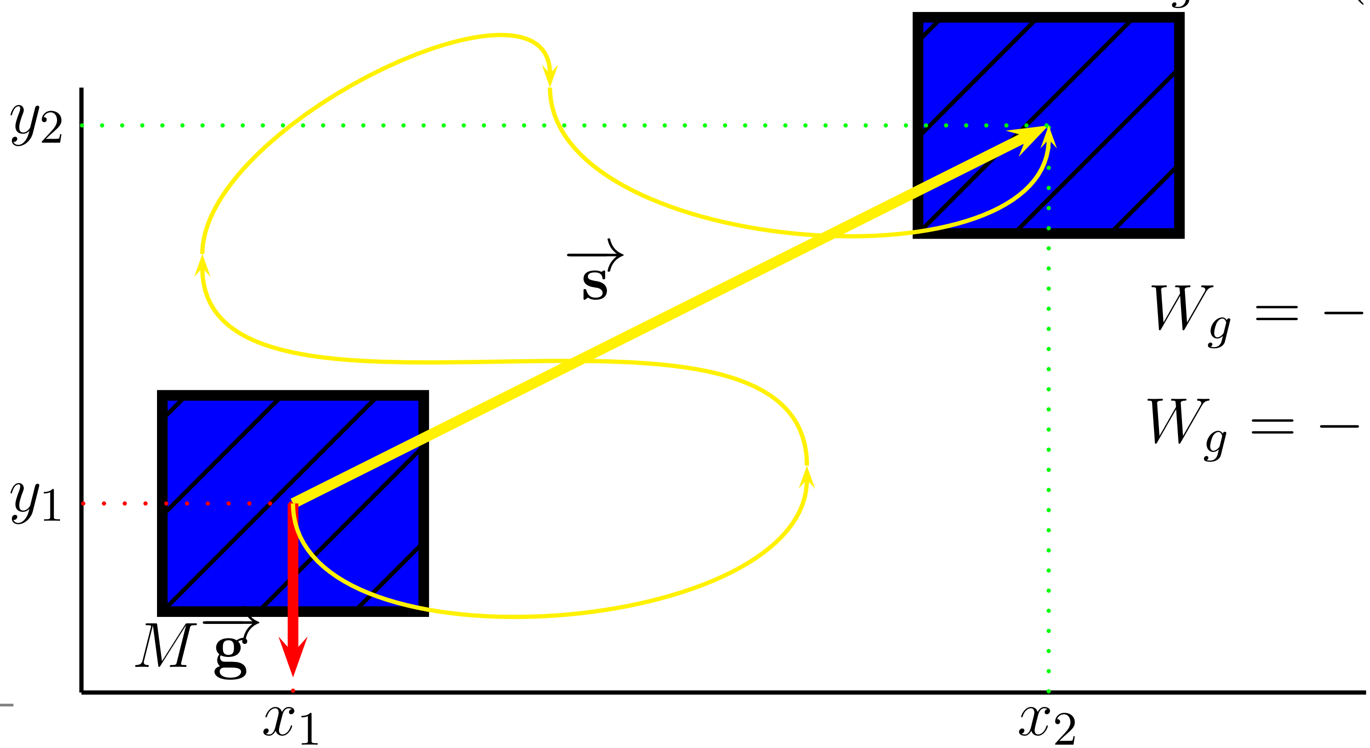

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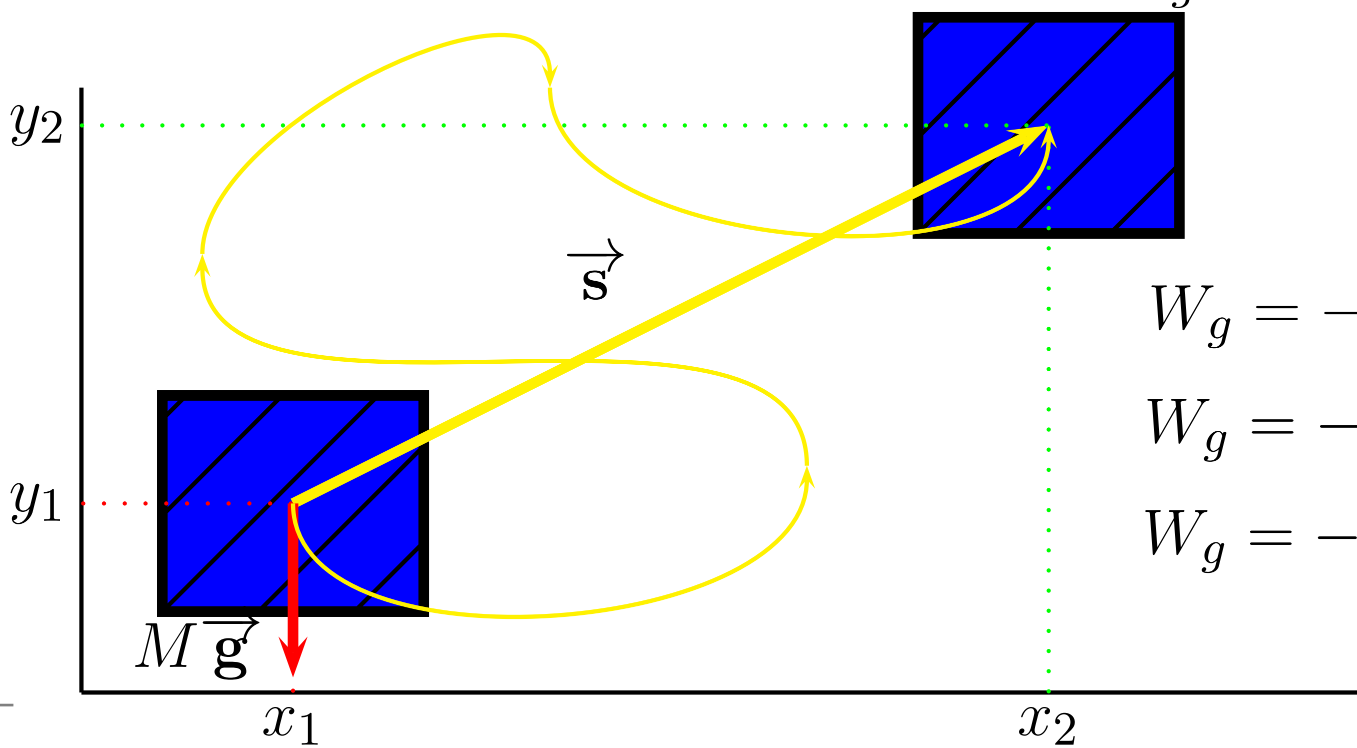

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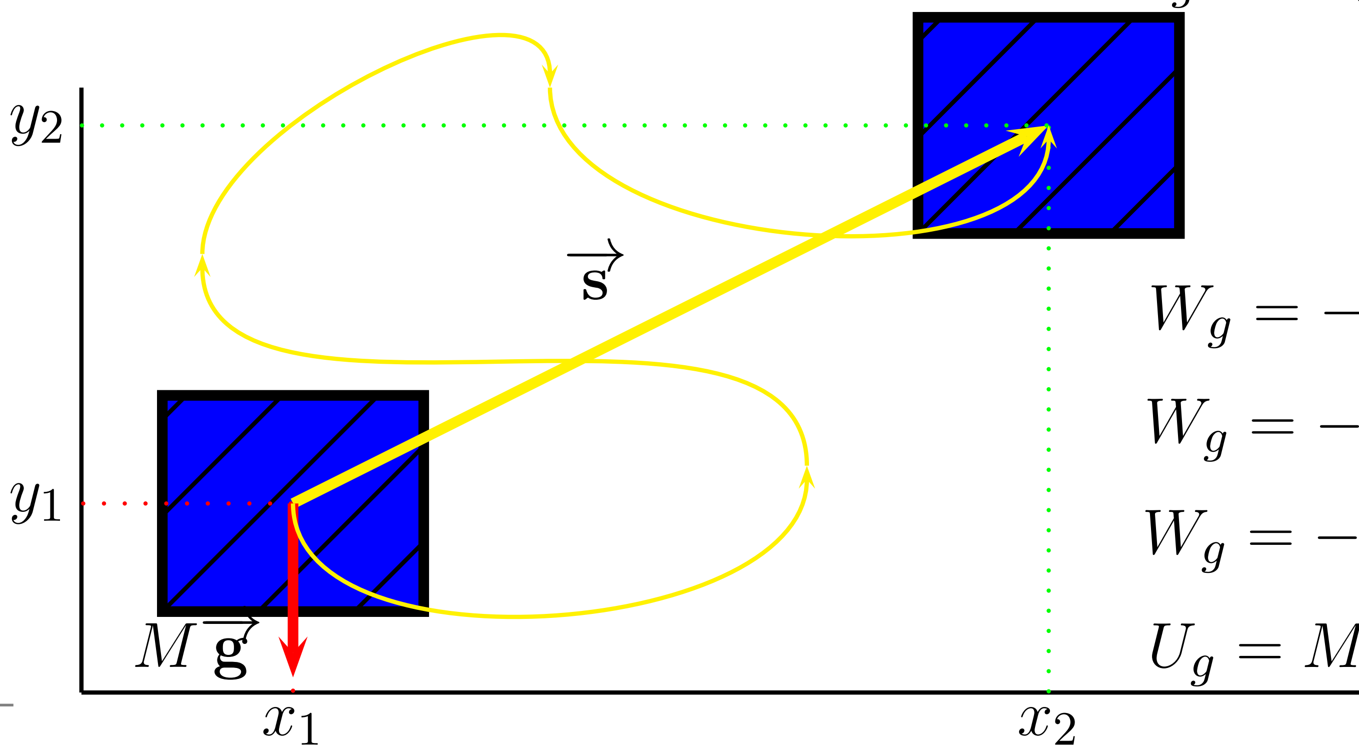

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