

PC212 Tutorial Problem Wilfrid Laurier University

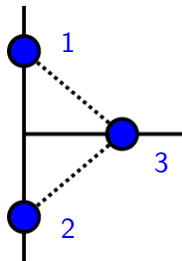
Terry Sturtevant

Wilfrid Laurier University

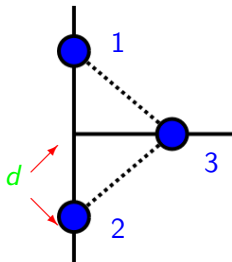
April 29, 2011

Definition

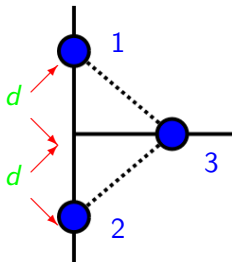
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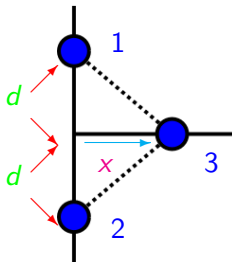
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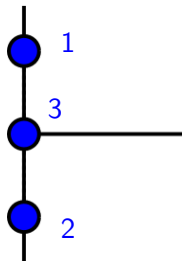
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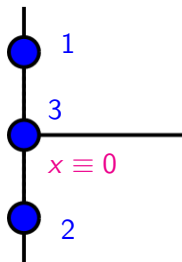
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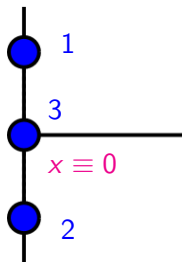
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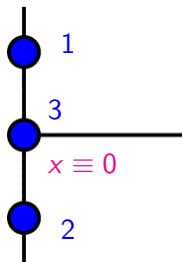


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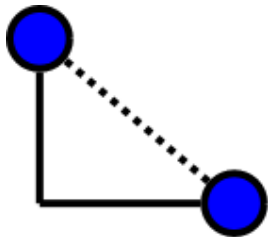
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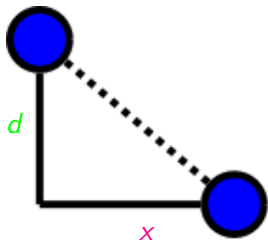
$$|F_x|_{3,net} = |F_{x31} + F_{x32}| = 2 |F_{x31}|$$

Calculations

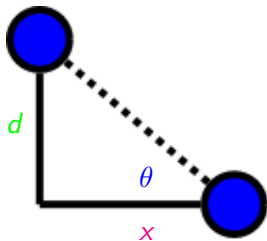
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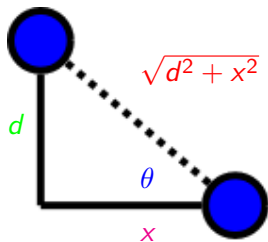
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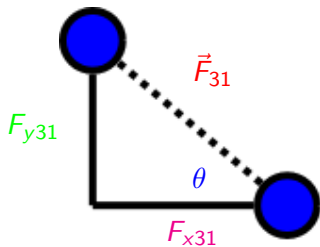
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$$\therefore F_{x31} = \frac{1}{4\pi\epsilon_0} \frac{q_1 q_3}{(d^2 + x^2)} \frac{x}{\sqrt{d^2 + x^2}} = \frac{q_1 q_3}{4\pi\epsilon_0} \frac{x}{(d^2 + x^2)^{3/2}}$$

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since none of the other terms are zero.

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$$(1) (d^2 + x^2)^{3/2} - (x) \frac{d}{dx} (d^2 + x^2)^{3/2}$$

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