February 11, Week 5

Today: Chapter 3, Acceleration Vector

Exam #1: Wednesday, February 13

Practice Exam available on website

Practice Exam and Homework solutions will be posted Tuesday morning

Review Session: Tuesday, February 12, 4:00-6:00 PM, Regener Hall 114

Help sessions with Jonathan:

M: 1000-1100, RH 111 T: 1000-1100, RH 114
Th: 0900-1000, RH 114

General Acceleration

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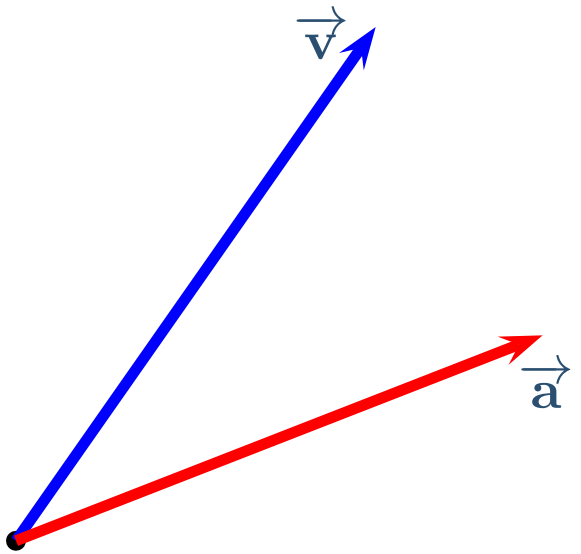

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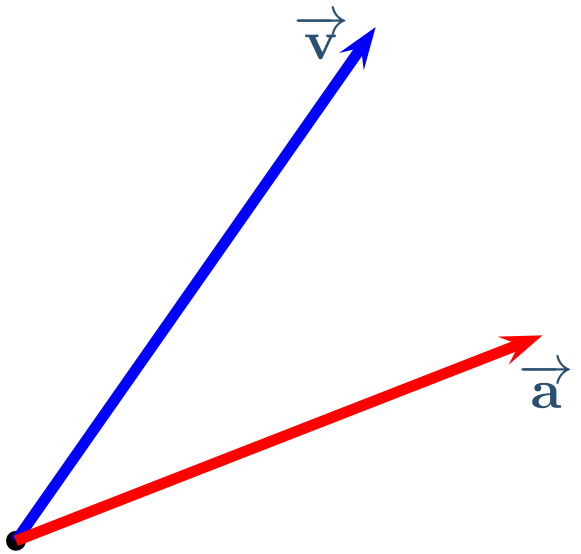

We split the acceleration into two components:

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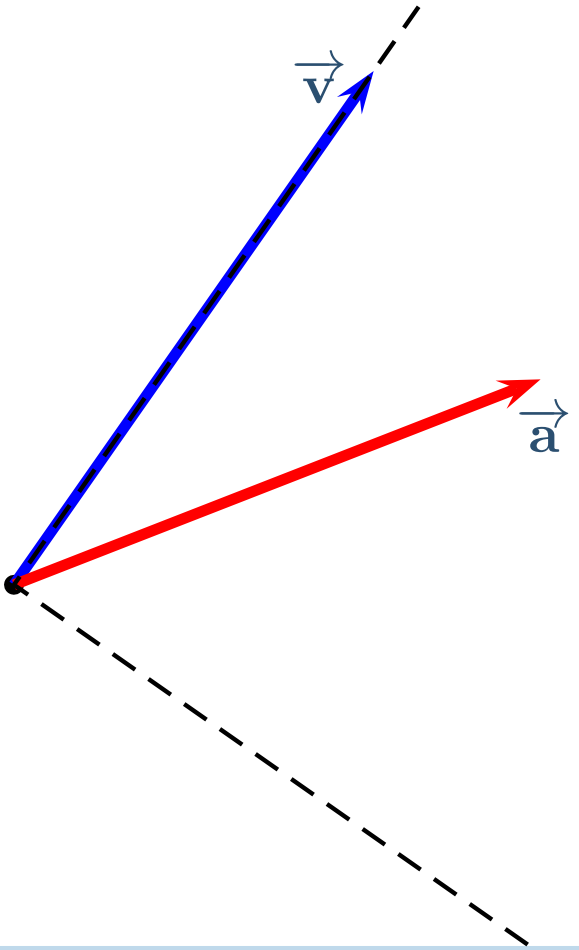

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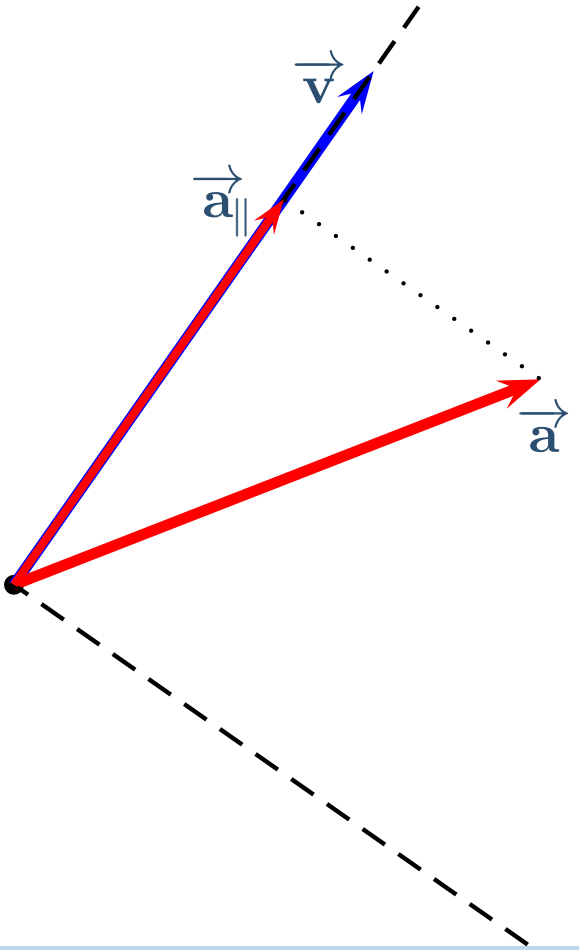

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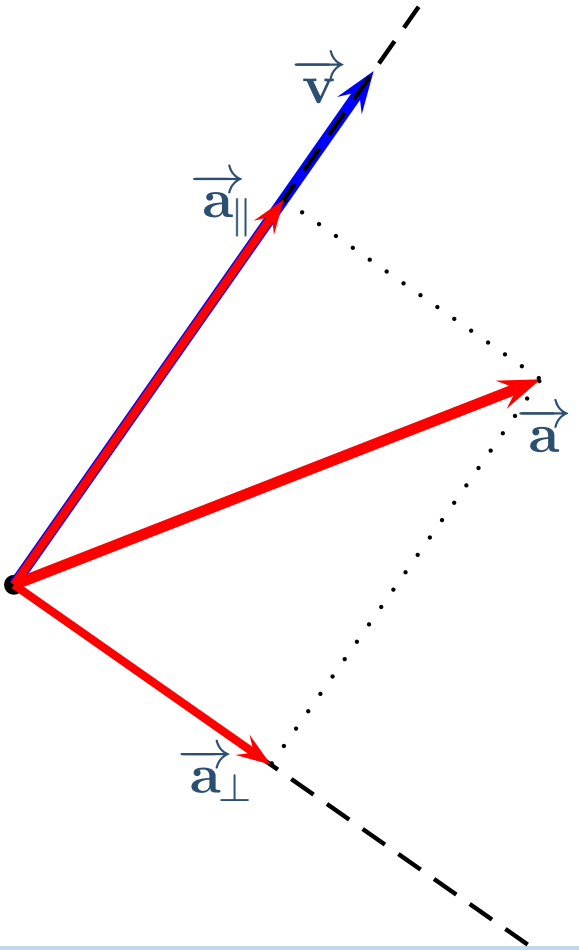

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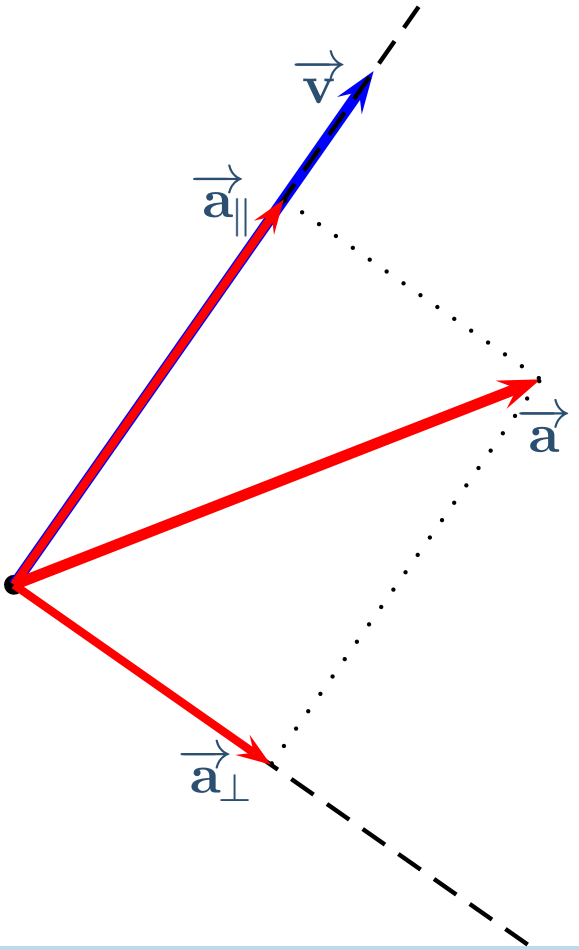

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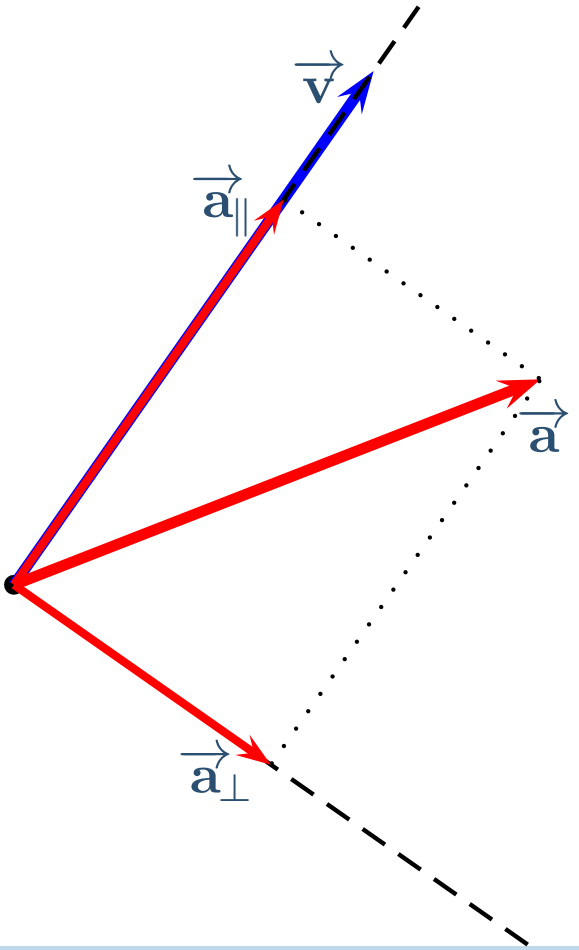

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Trajectory Exercise

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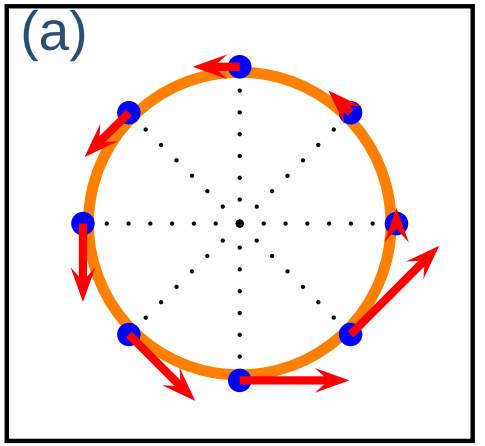

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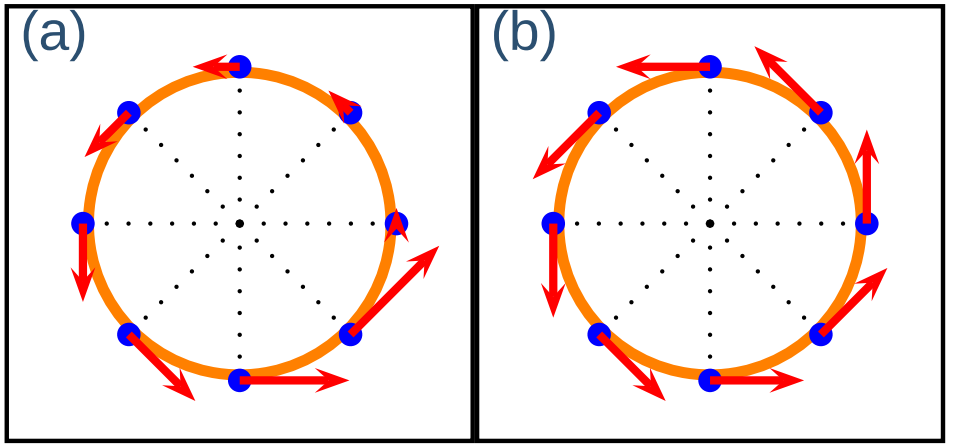

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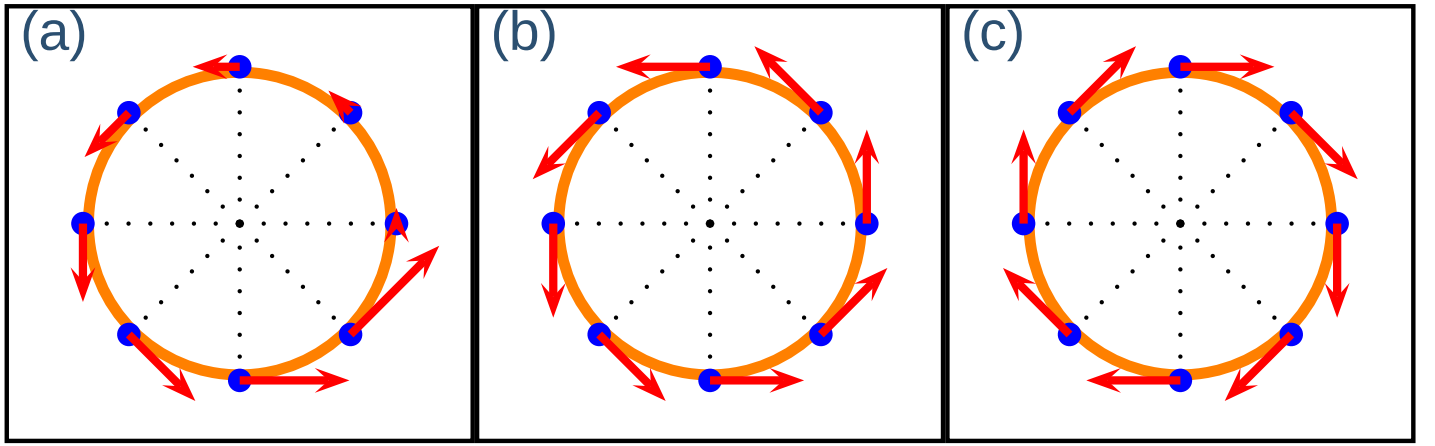

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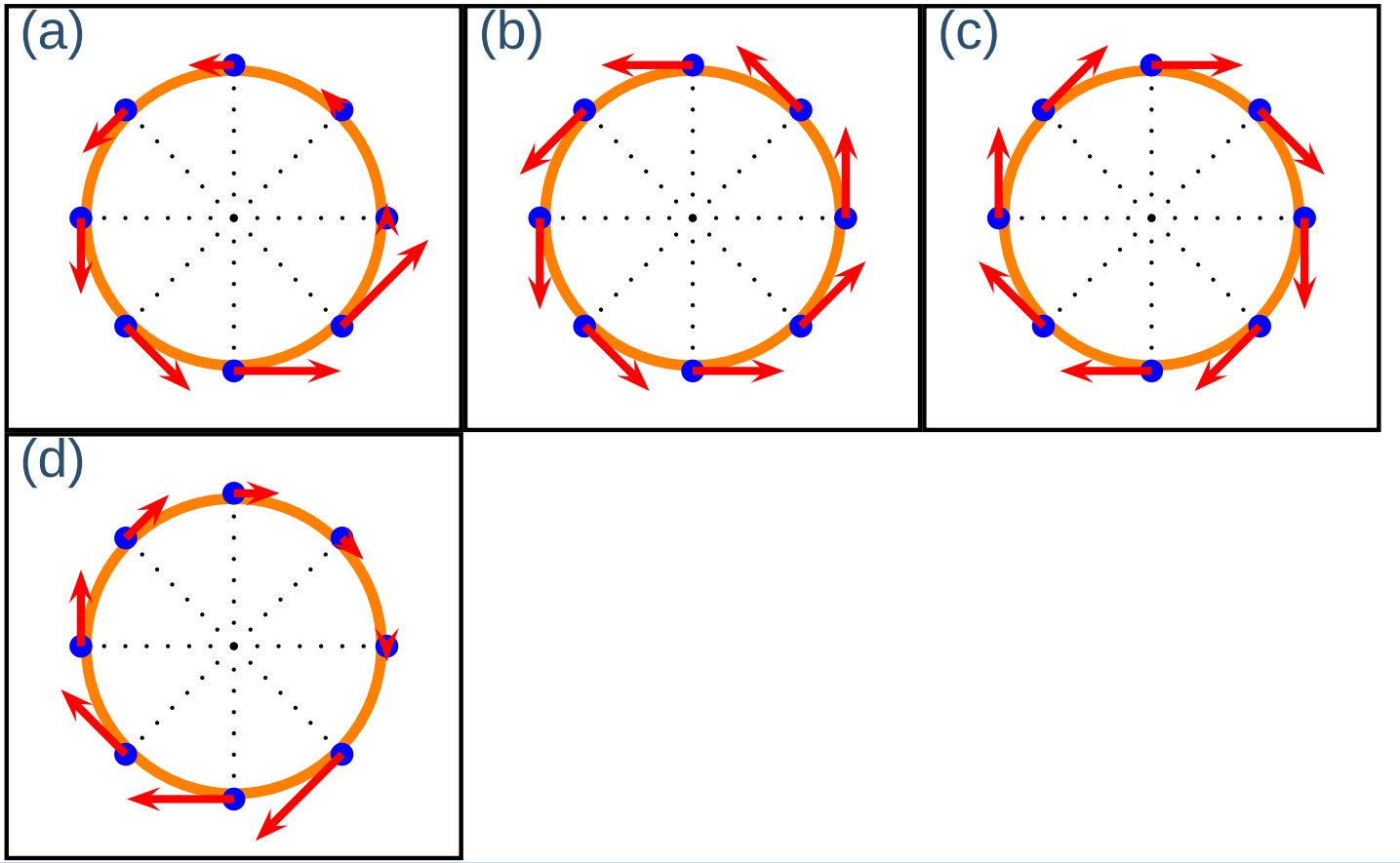

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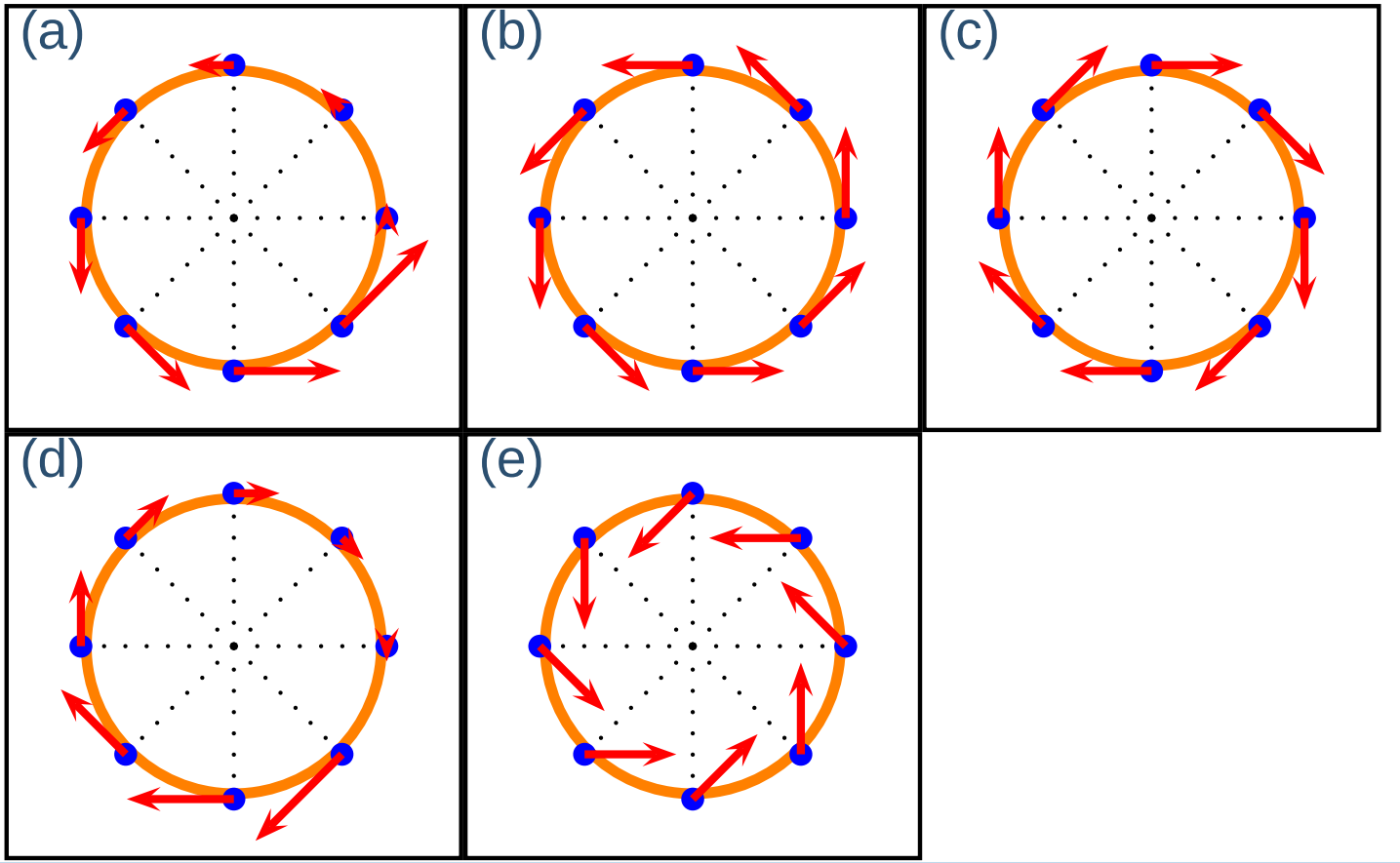

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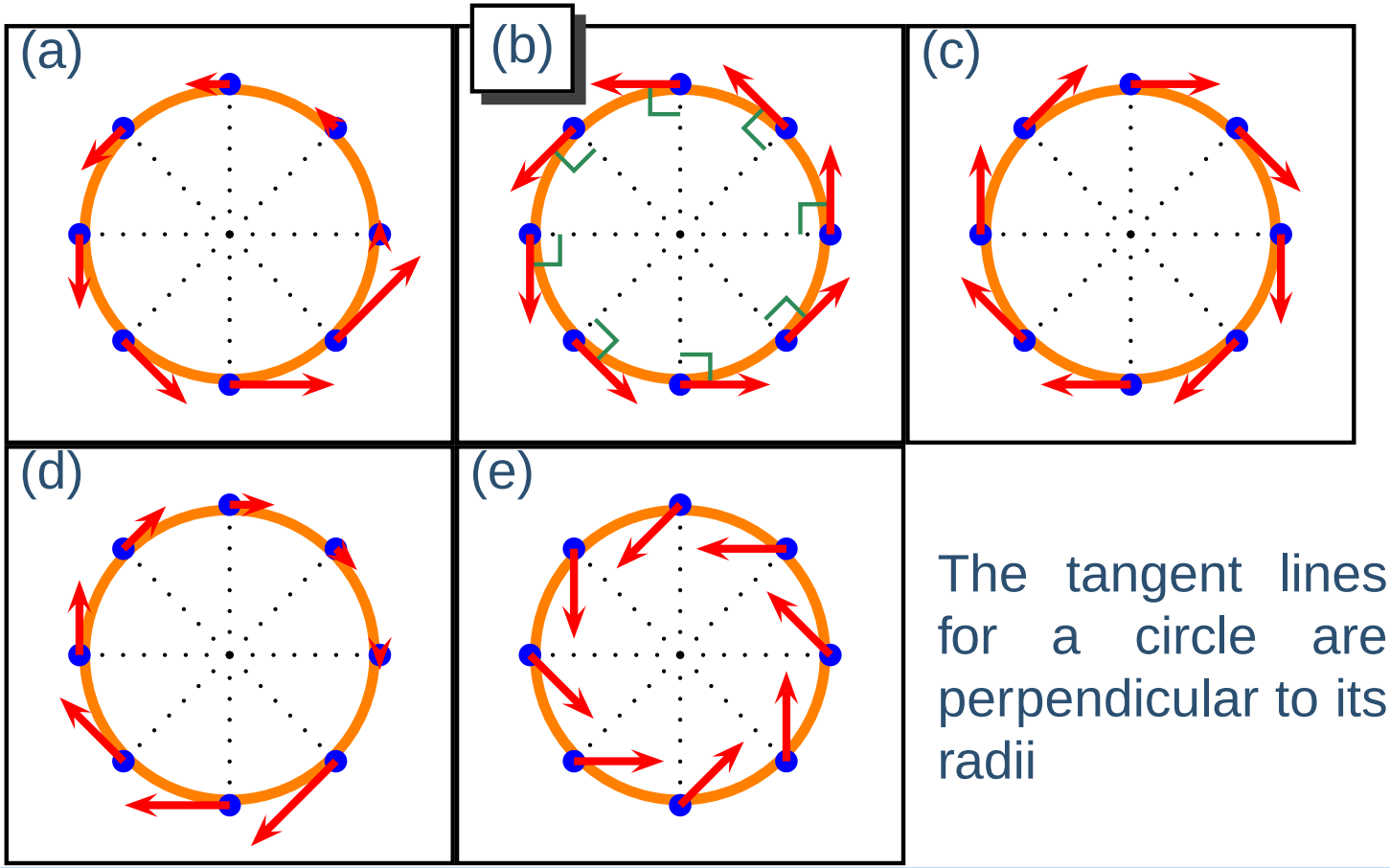

The tangent lines for a circle are perpendicular to its radii

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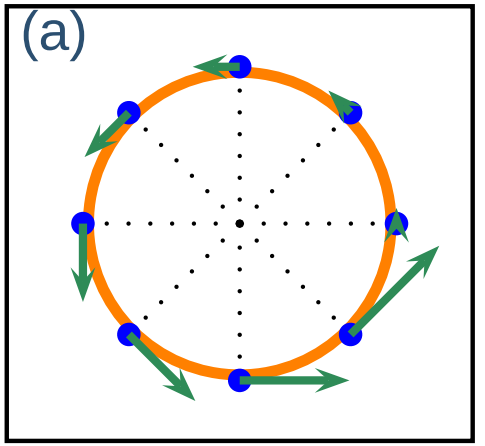

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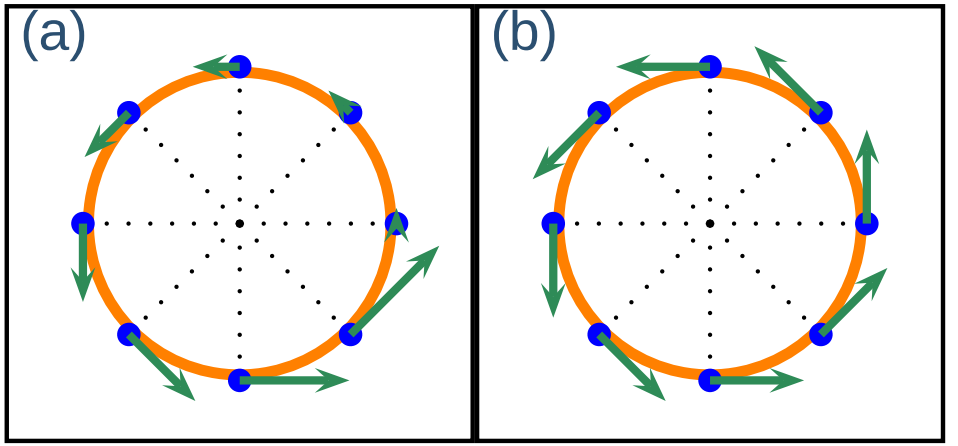

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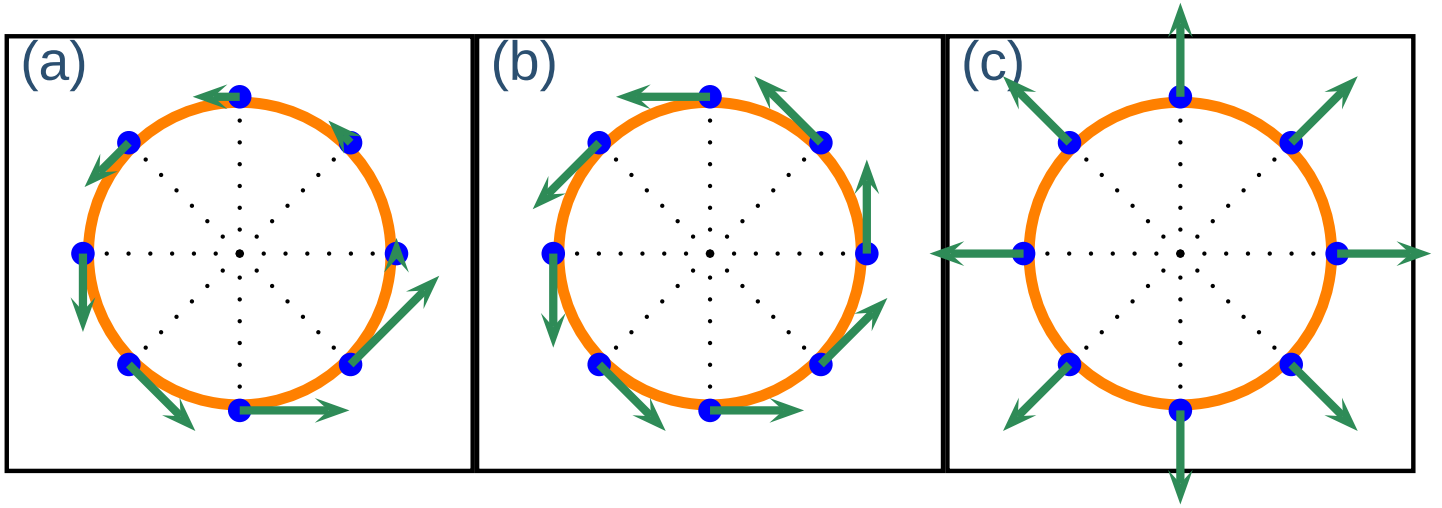

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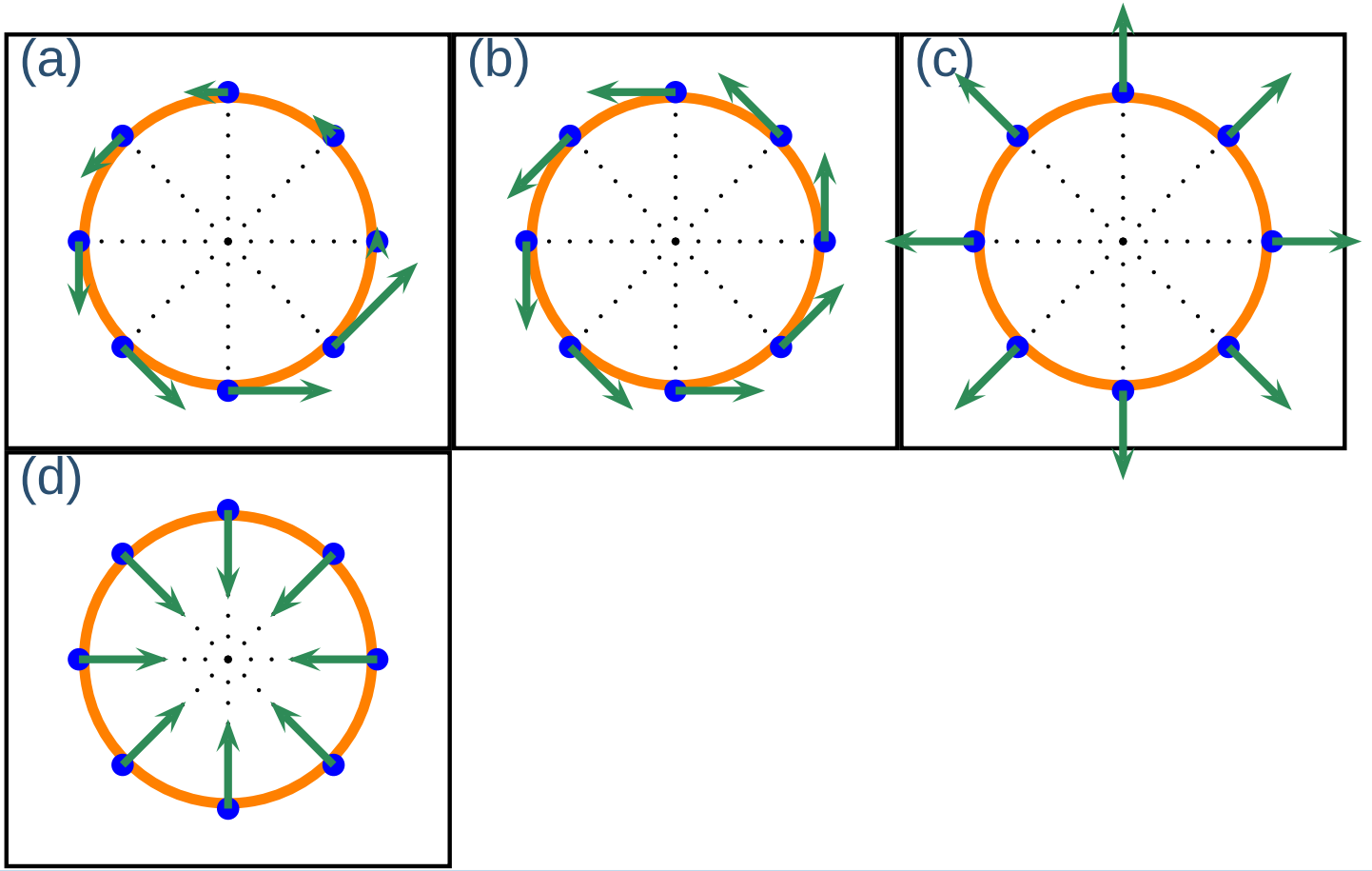

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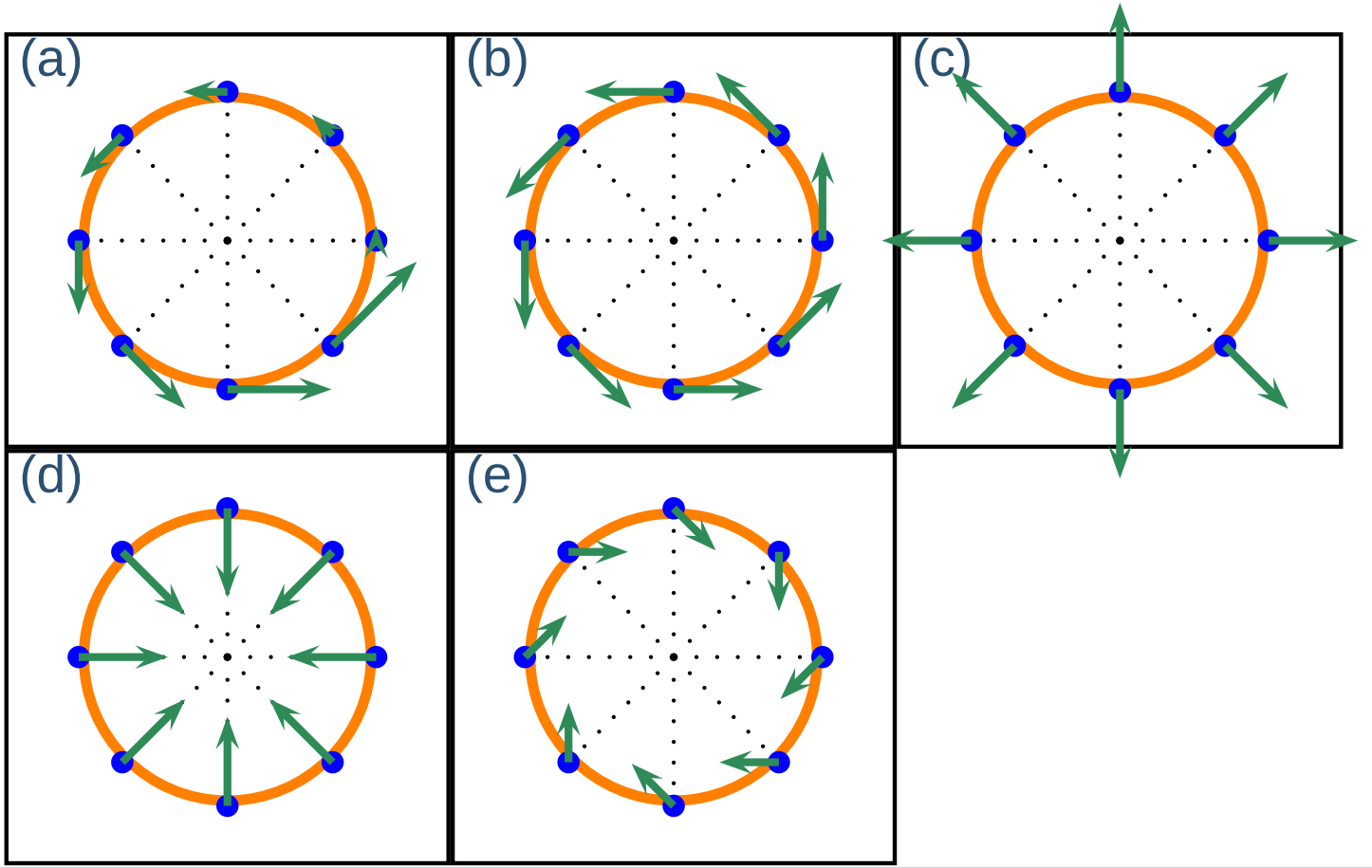

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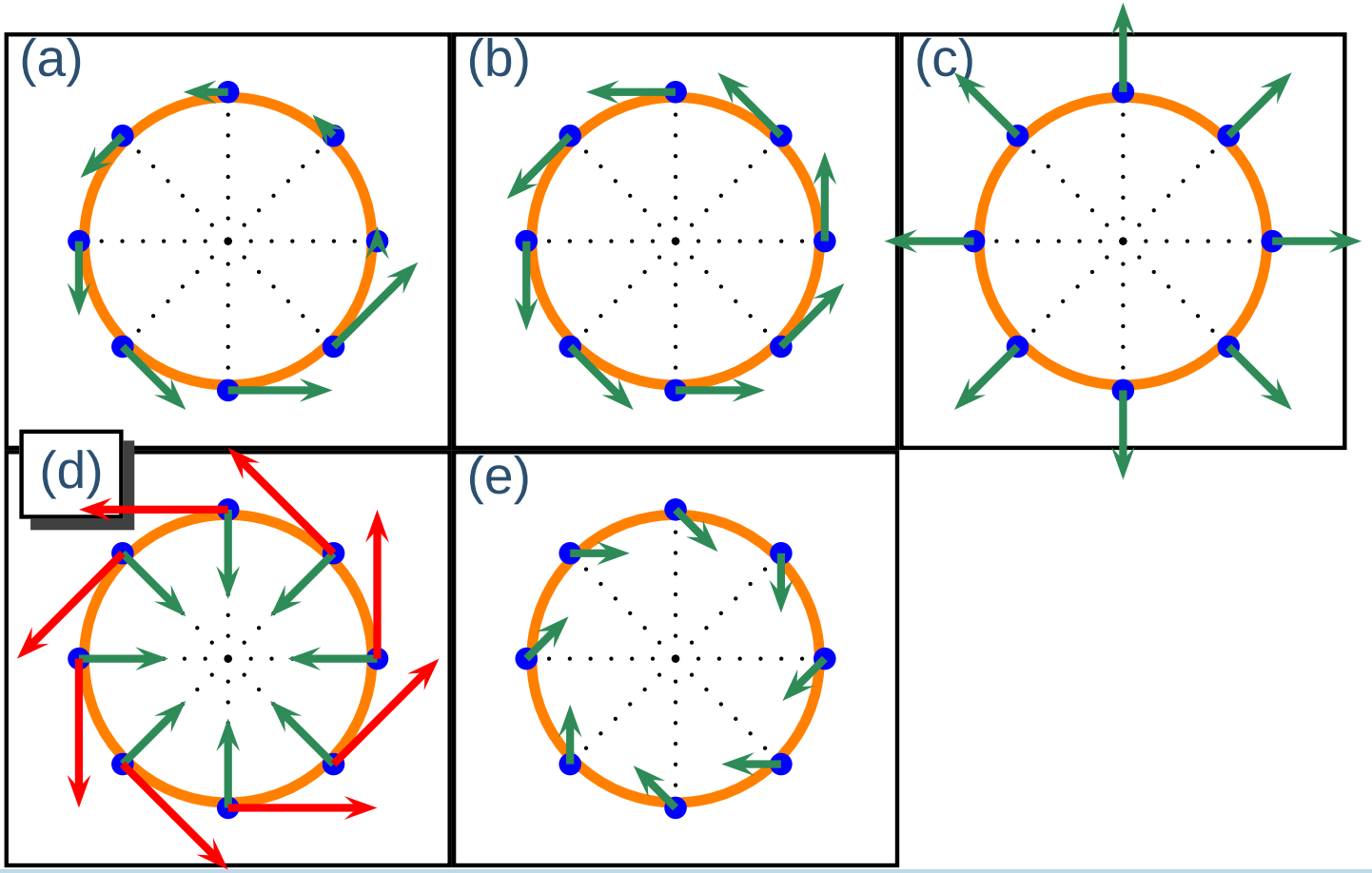

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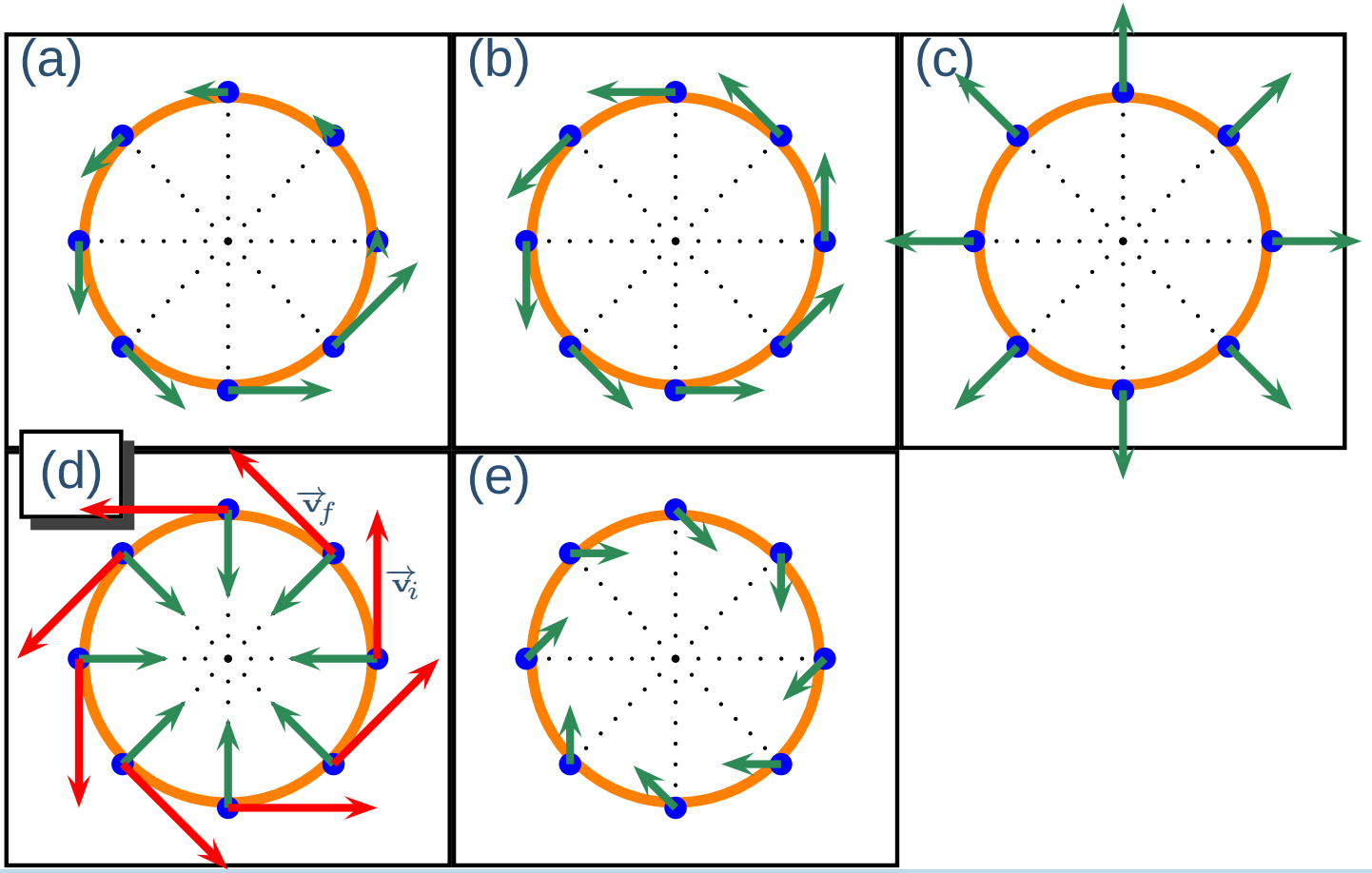

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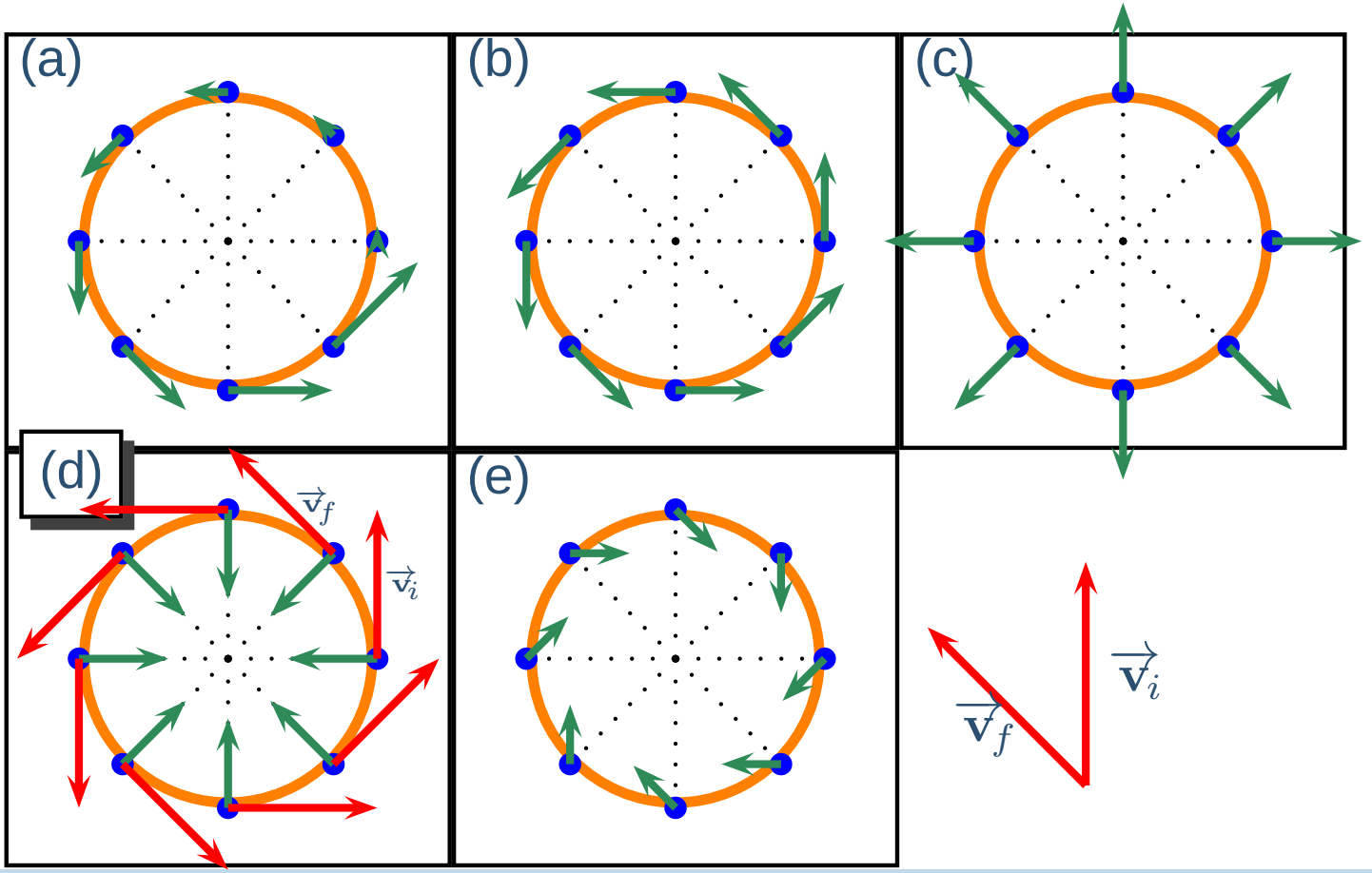

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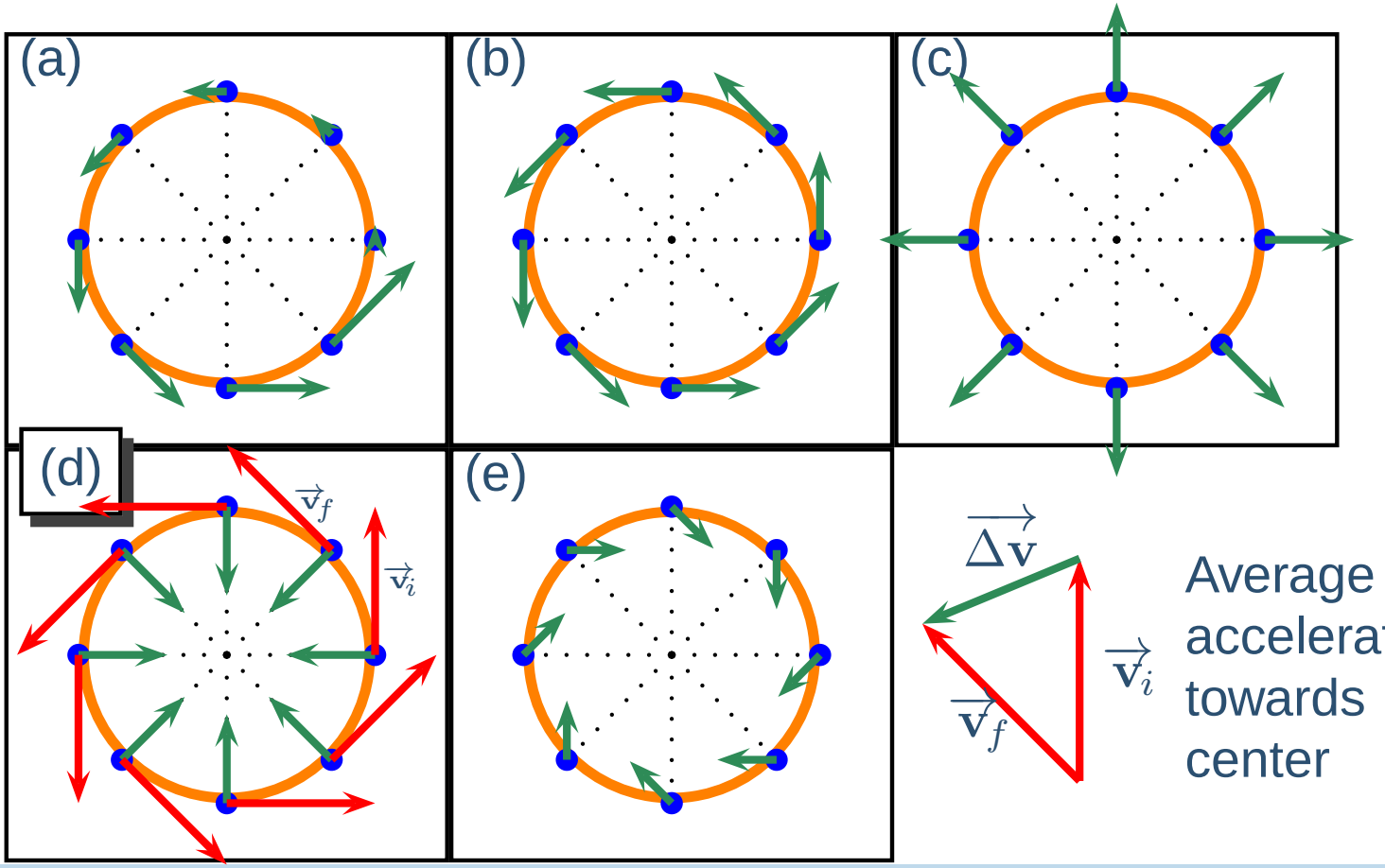
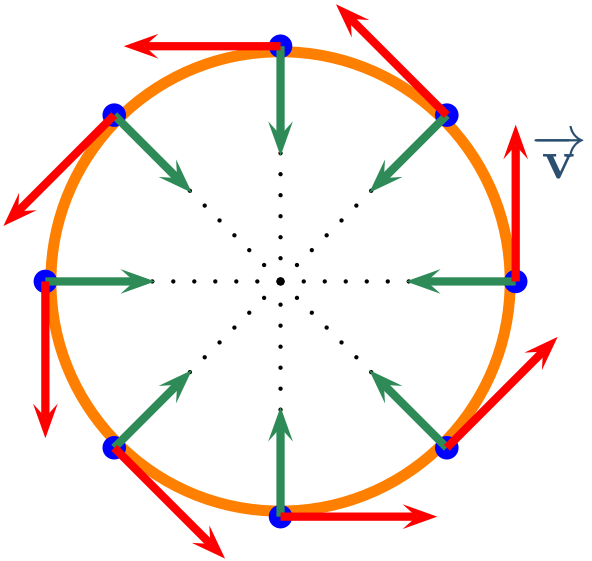


Centripetal Acceleration

The inwards acceleration needed to go around a circle is given a special name and has its own equation



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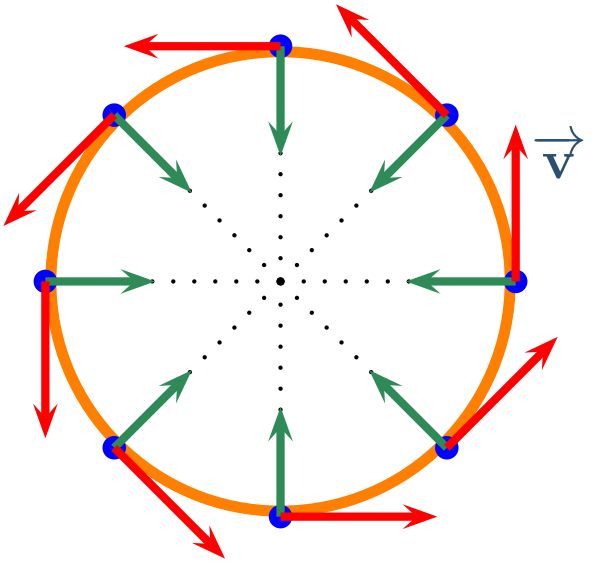

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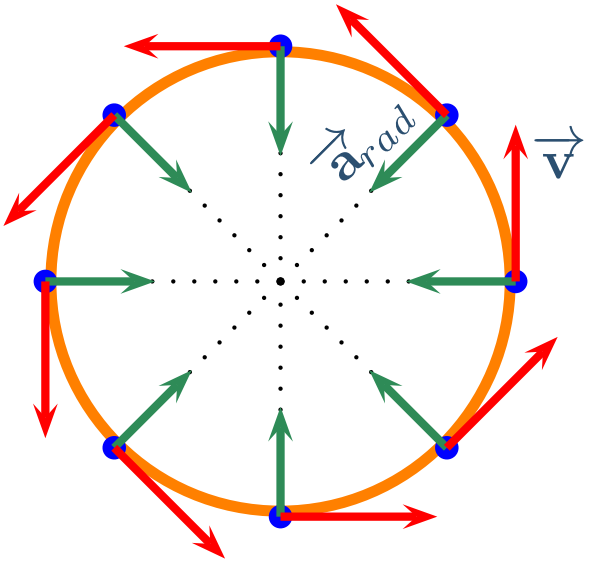

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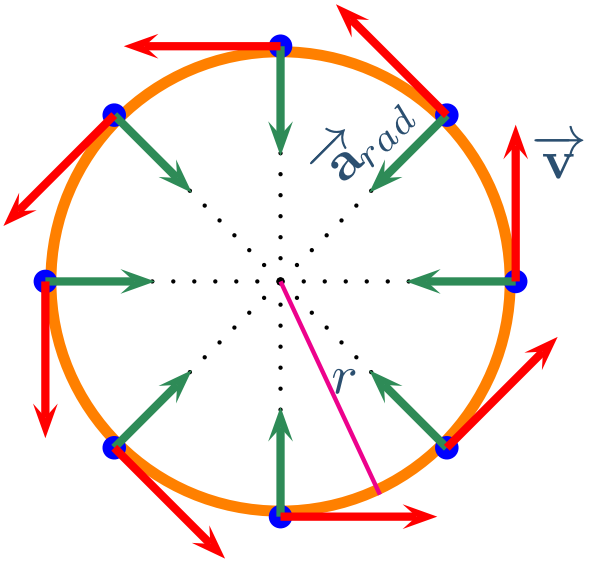

Centripetal Acceleration, a_{rad} - inwards acceleration necessary for circular motion

It can be shown: $$a_{rad} = \frac{v^2}{r}$$

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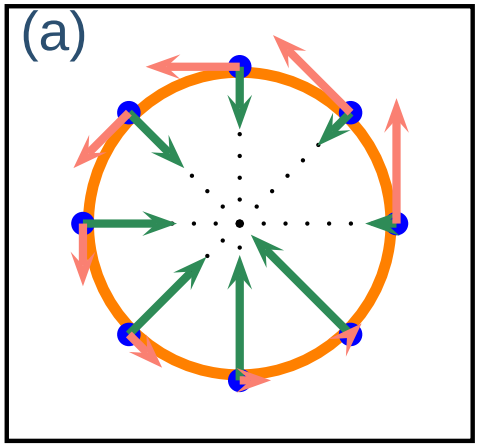

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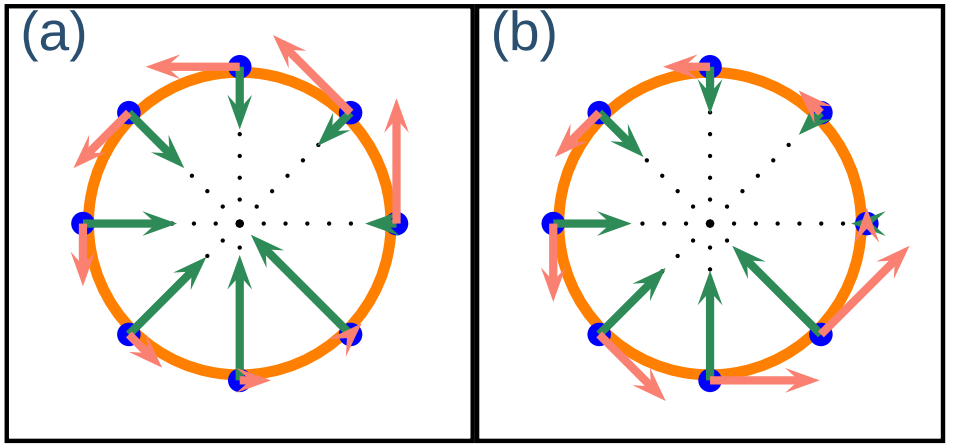

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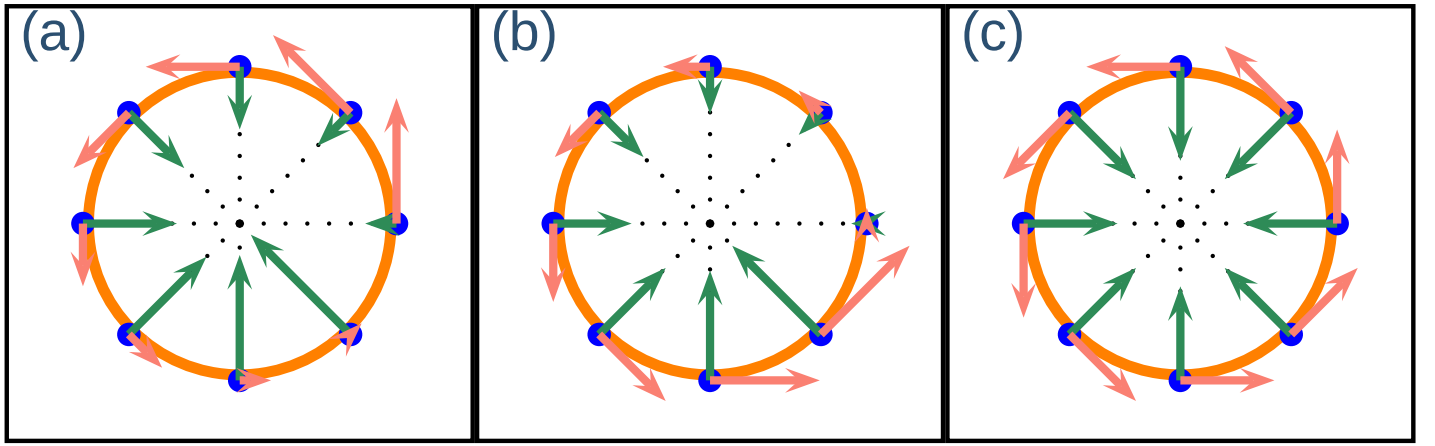

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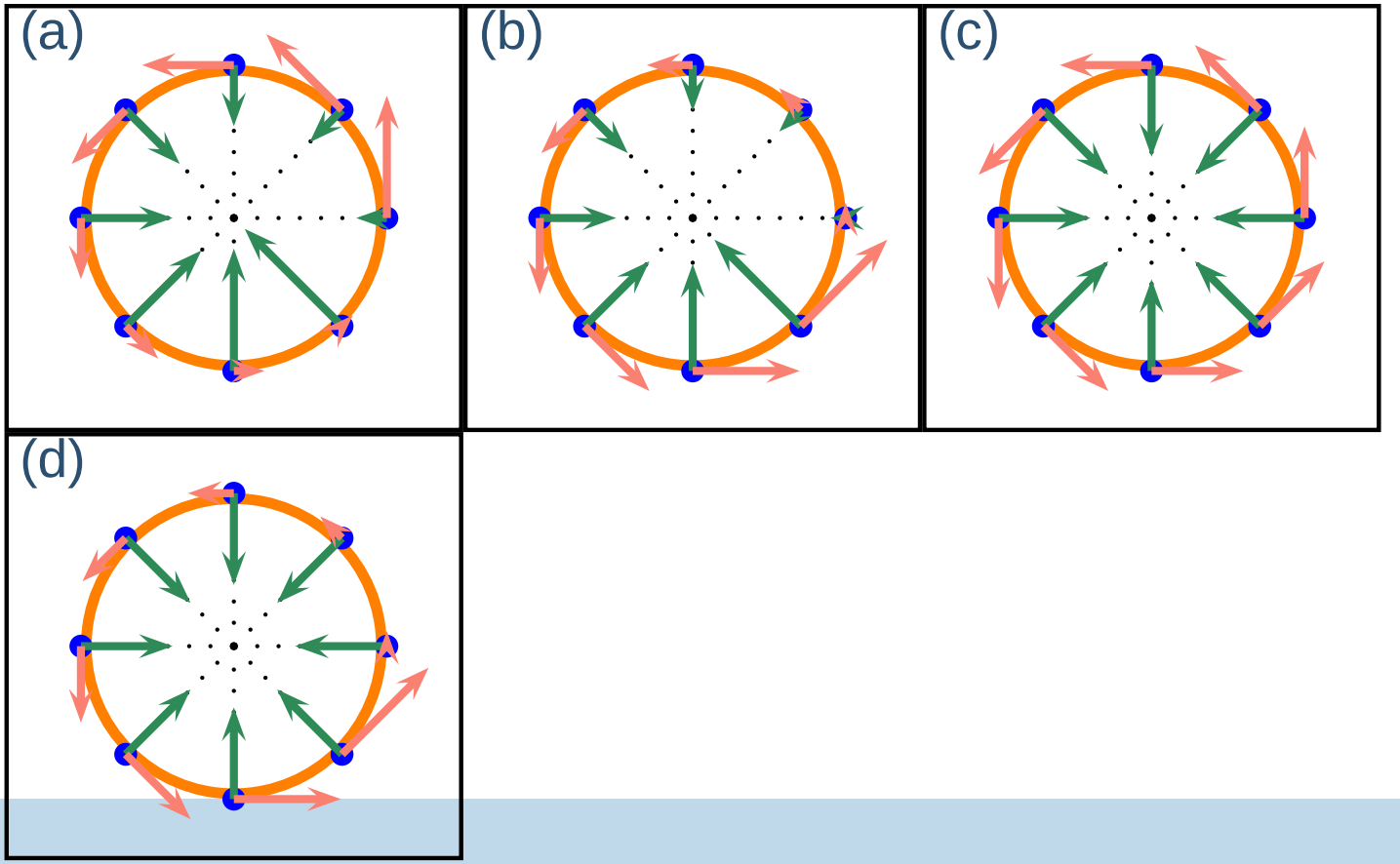

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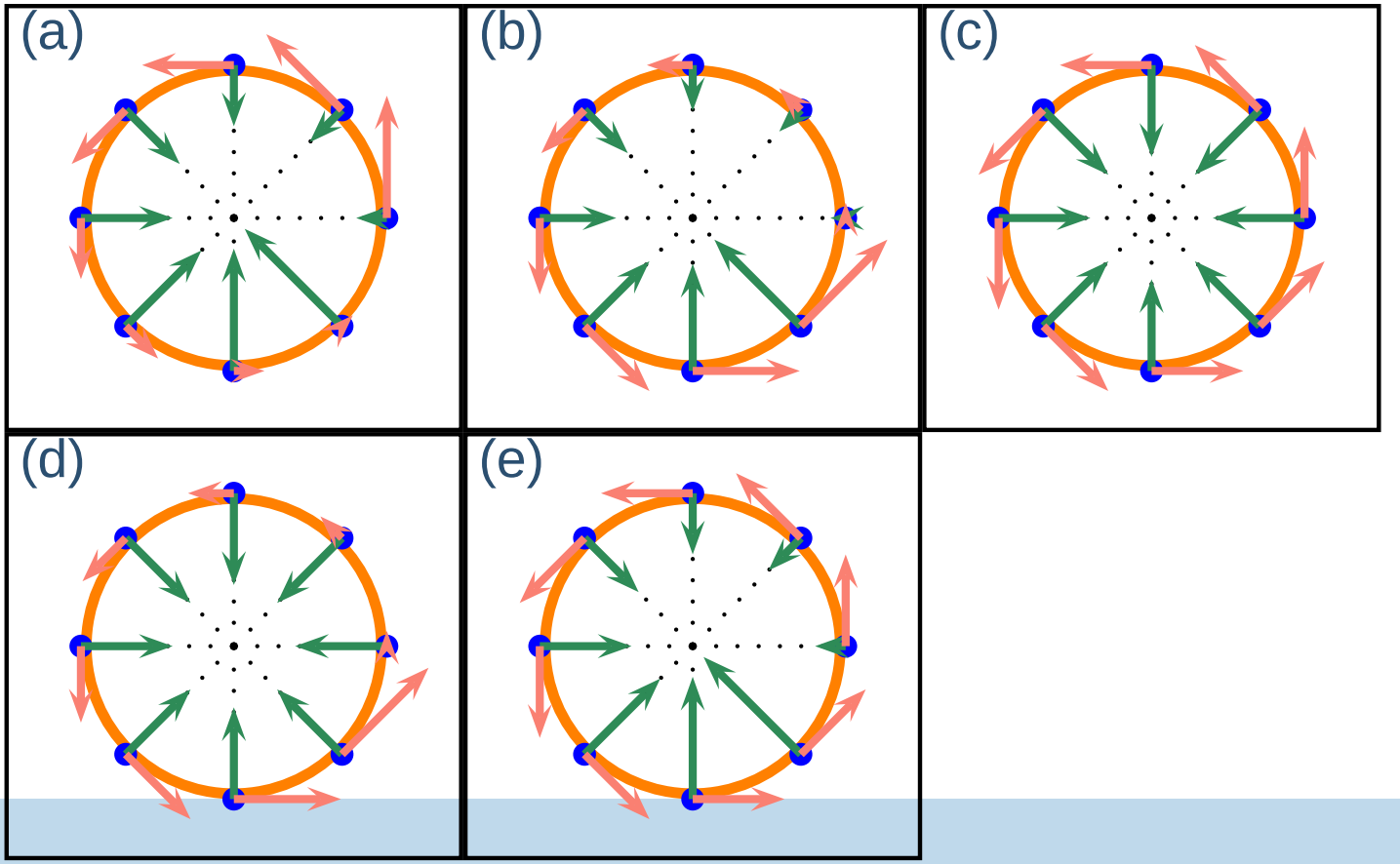

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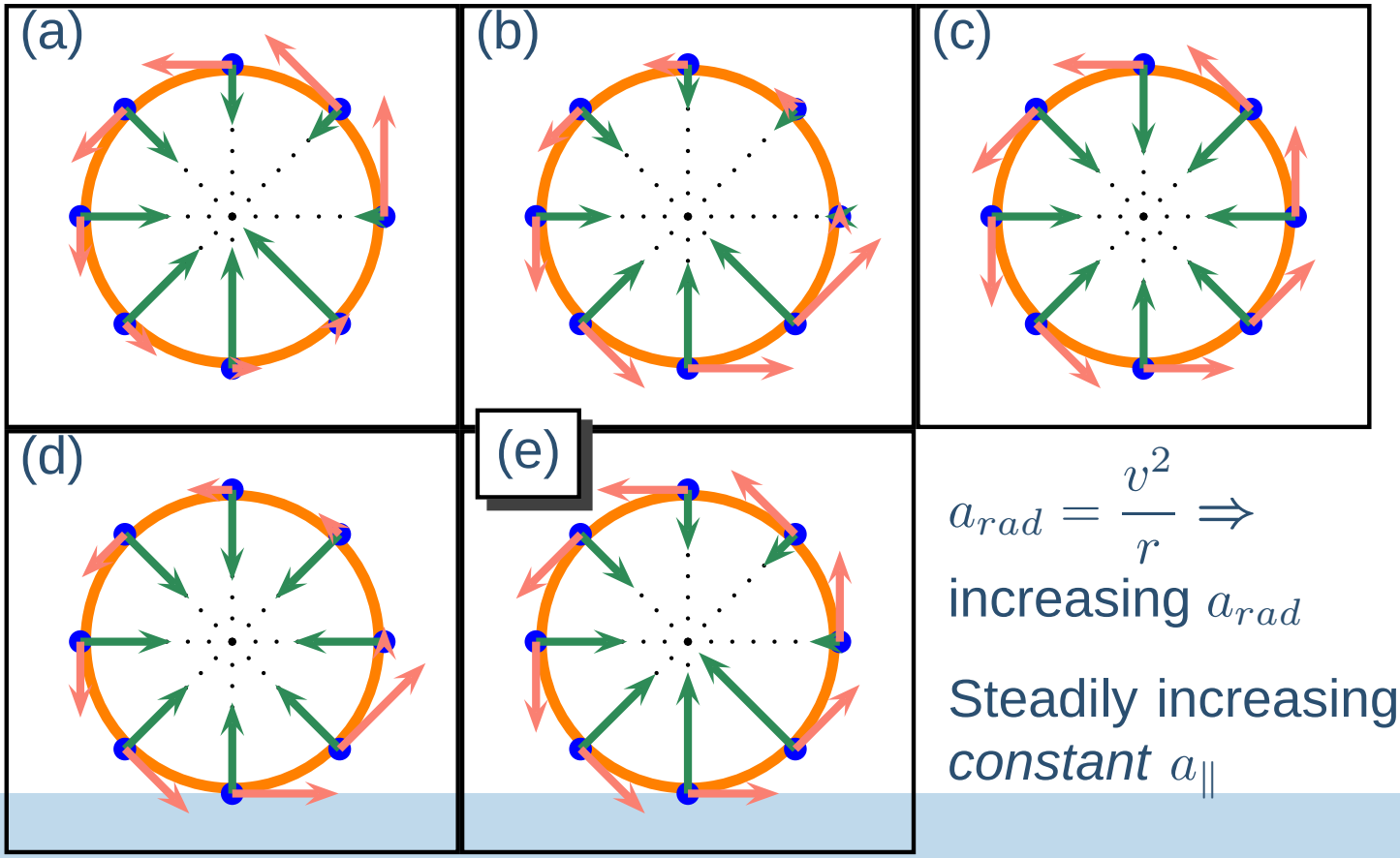

$a_{rad} = \frac{v^2}{r} \Rightarrow$

increasing a_{rad}

Steadily increasing $\Rightarrow$ *constant* $a_{\|}$