

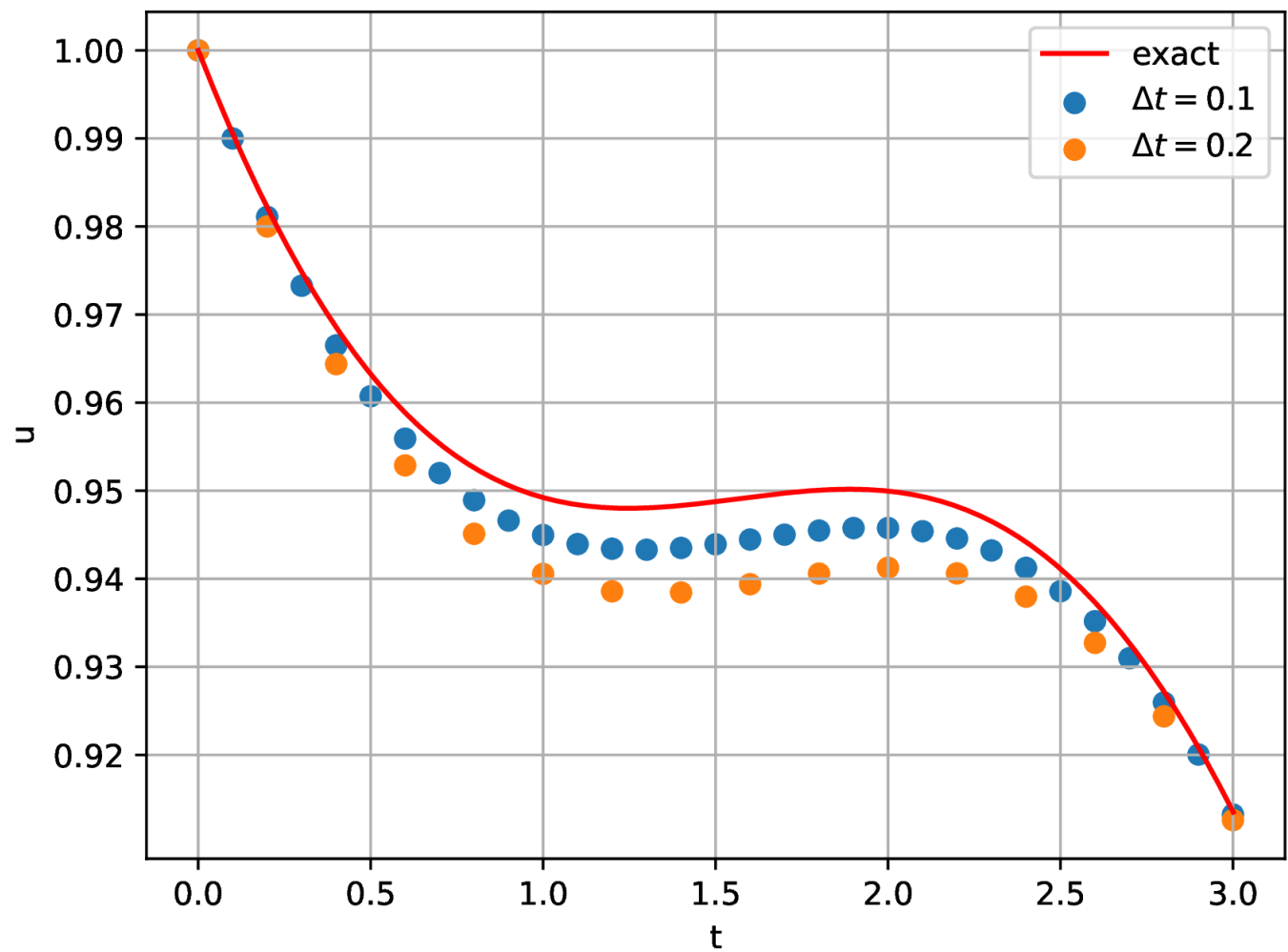
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5.1.4 Exam: Identify error behavior for a numerical method

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Exams due Aug 30, 2023 05:00 IST Completed

A numerical method is used to solve an Initial Value Problem for the state $u(t)$ using timesteps of $\Delta t = 0.1$ and 0.2 . The results from the numerical method as well as the exact solution are shown in the plot below.



Problem: Error at $t=2.4$ with coarser timestep

1/1 point (graded)

Select the value which approximates the magnitude of the error at $t = 2.4$ for $\Delta t = 0.2$ in the above plot?

☐ 0.003

☒ 0.006

☐ 0.938

☐ 0.941

☐ 0.944



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i Answers are displayed within the problem

Problem: Error at $t=2.4$ with finer timestep

1/1 point (graded)

Select the value which approximates the magnitude of the error at $t = 2.4$ for $\Delta t = 0.1$ in the above plot?

☒ 0.003

☐ 0.006

☐ 0.938

☐ 0.941

☐ 0.944

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Problem: When is the error largest for coarser timestep

1/1 point (graded)
For the coarser timestep ($\Delta t = 0.2$), which of the following times has the largest error magnitude? Note: these times may not include the time at which the maximum error occurs for this timestep. Just identify the time *among those listed* that has the largest error.

☐ t=0.6

☒ t=1.0

☐ t=2.4

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Problem: Find the correct convergence plot

2.0/2.0 points (graded)
Which line on the plot of e_{\max} (i.e. the maximum error magnitude for over all time) versus Δt below is consistent with the results from the numerical method.

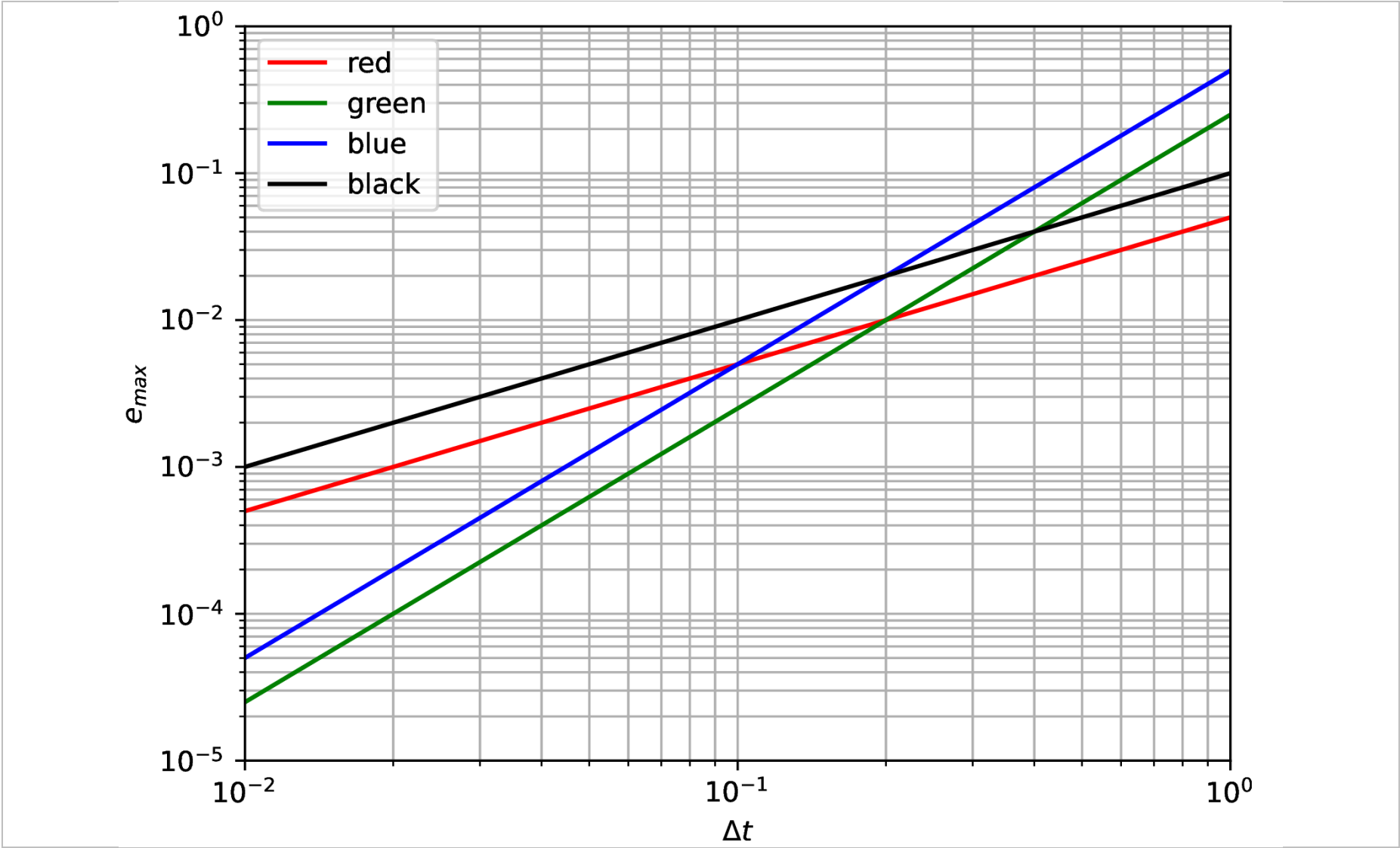
☒ red

☐ green

☐ blue

☐ black

☐ None of the above



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i Answers are displayed within the problem

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