Suggested problems 11

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1. Consider the initial value problem

$$(t^2 + t)y' + \frac{1}{(t-4)}y = e^{2t}, \qquad y(2) = 3\pi.$$

According to the Existence and Uniqueness Theorem, what is the largest interval in which a unique solution is guaranteed to exist?

2. Consider the initial value problem

$$t(t-2)(t-4)y' + y = e^{t^2}, \qquad y(3) = -6.$$

What is the largest interval in which a unique solution is guaranteed to exist?