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Problem: Nonlinear Dynamics

Nonlinear Dynamics

0.0/20.0 points (graded)

Consider a system with the dynamics given by

$$\dot{x} = x^3 + 2x^2 - 5x - 6$$

Fill in the MATLAB code below, which is supposed to:

- Plot a phase diagram \dot{x} vs. x for this system and set the three equilibrium points. Ensure that all equilibrium points are included in the plot range.
- Set the variable "eq_points" such that $x = \text{eq_points}(i)$ is an equilibrium point.

Do not change the variable names x , \dot{x} , and eq_points.

```
1 x =  
2 xdot =  
3 eq_points =  
4 plot(x,xdot)  
5
```

Unanswered

Run Code

Is the first equilibrium point (at the smallest value of x) stable, unstable, or marginally stable?

☐ Stable☐ Unstable☐ Marginally stable

Is the second equilibrium point stable, unstable, or marginally stable?

☐ Stable☐ Unstable☐ Marginally stable

Is the third equilibrium point (at the largest value of $f(x)$) stable, unstable, or marginally stable?

☐ Stable☐ Unstable☐ Marginally stable

There is an interval, containing the origin, that is a region of attraction for one of these points. Identify this interval, using standard notation of (a, b) for open intervals and $[a, b]$ for closed intervals. Indicate a interval extending to infinity with "-inf" or "inf."

You have used 0 of 3 attempts

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