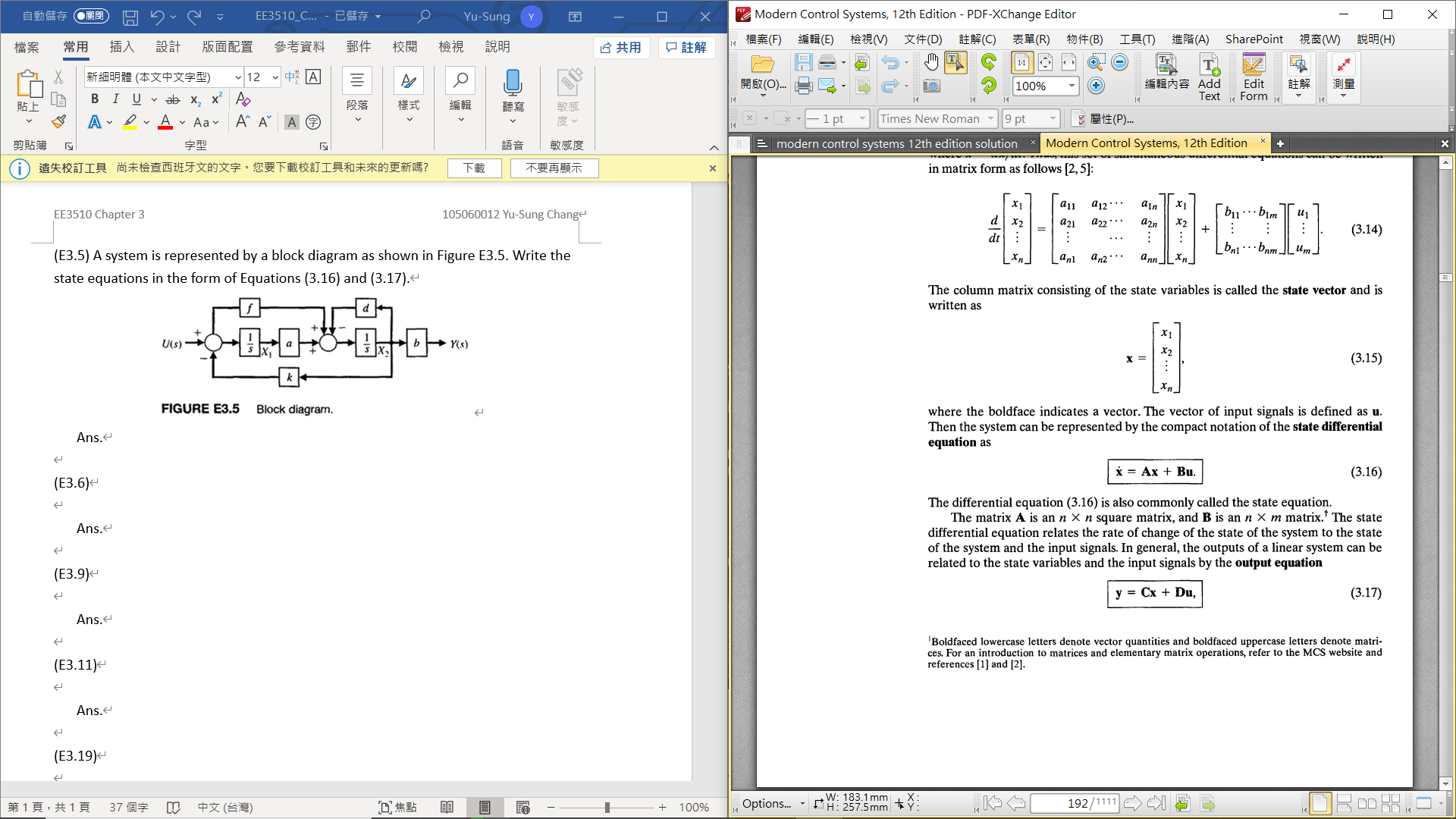
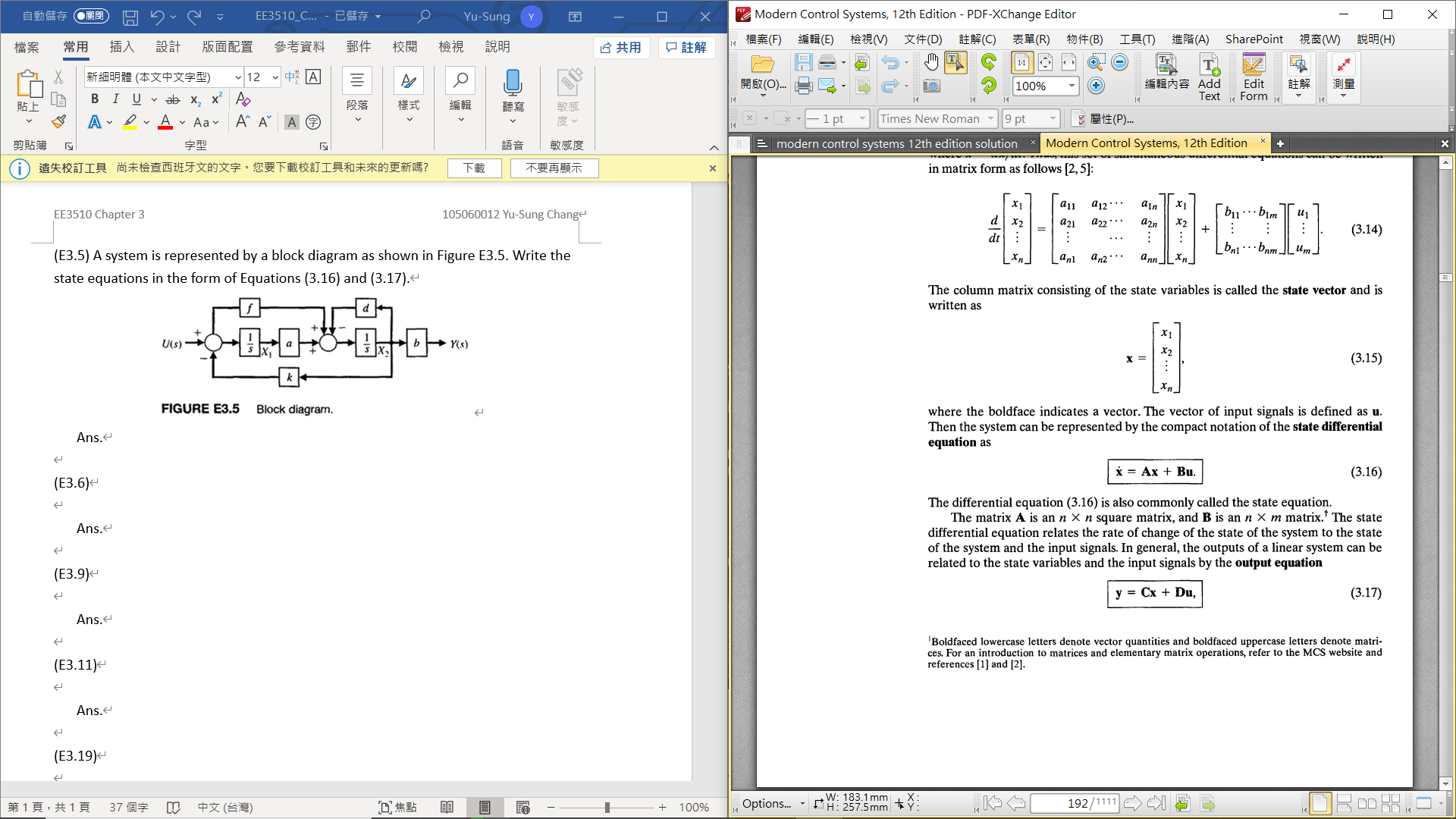
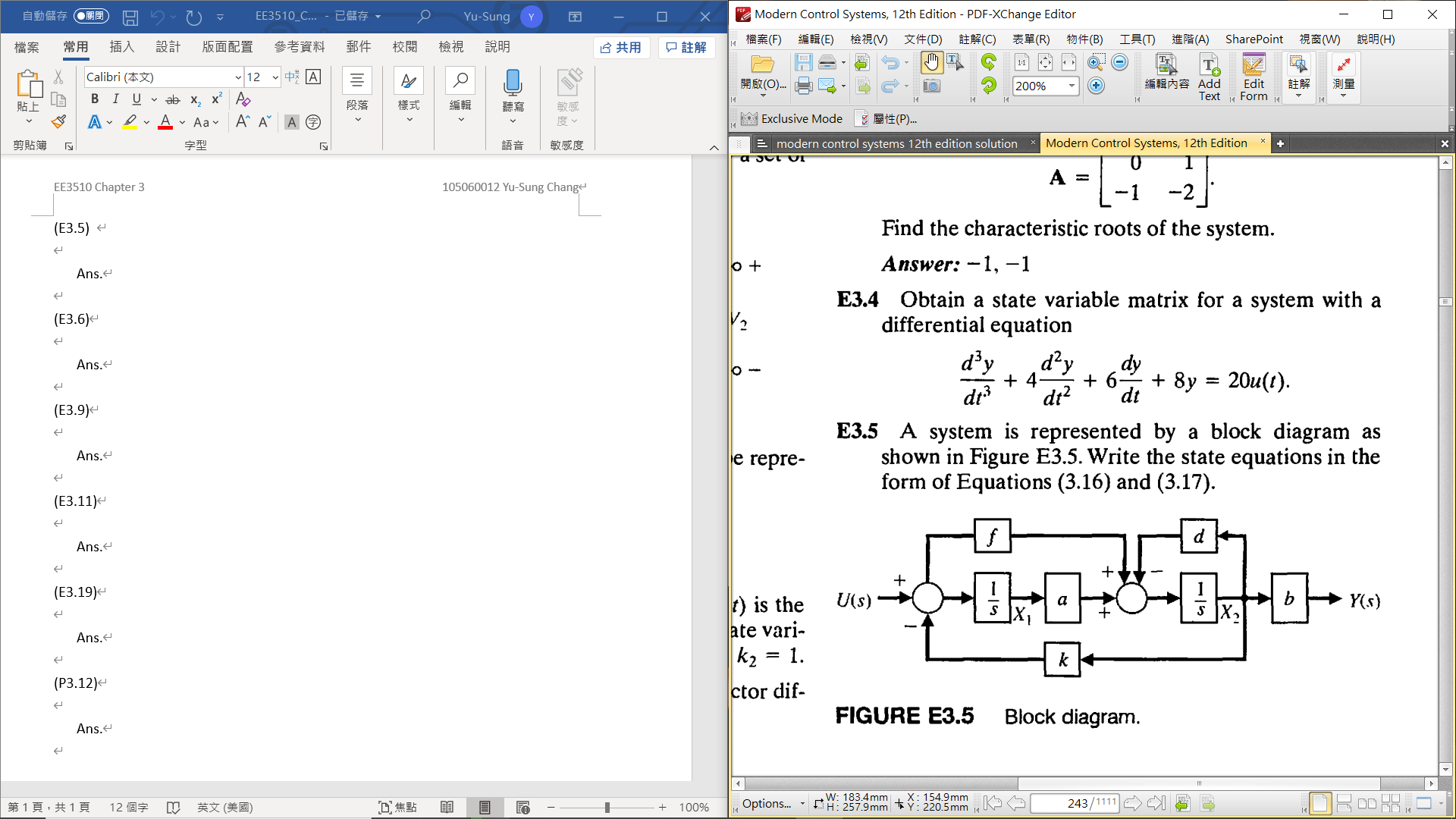
(E3.5) A system is represented by a block diagram as shown in Figure E3.5. Write the state equations in the form of Equations (3.16) and (3.17).





Ans.

* Therefore,

(E3.6) A system is represented by Equation (3.16), where

1. Find the matrix
2. For the initial conditions x1(0) = x2(0) = l, find **x**(t).

Ans.

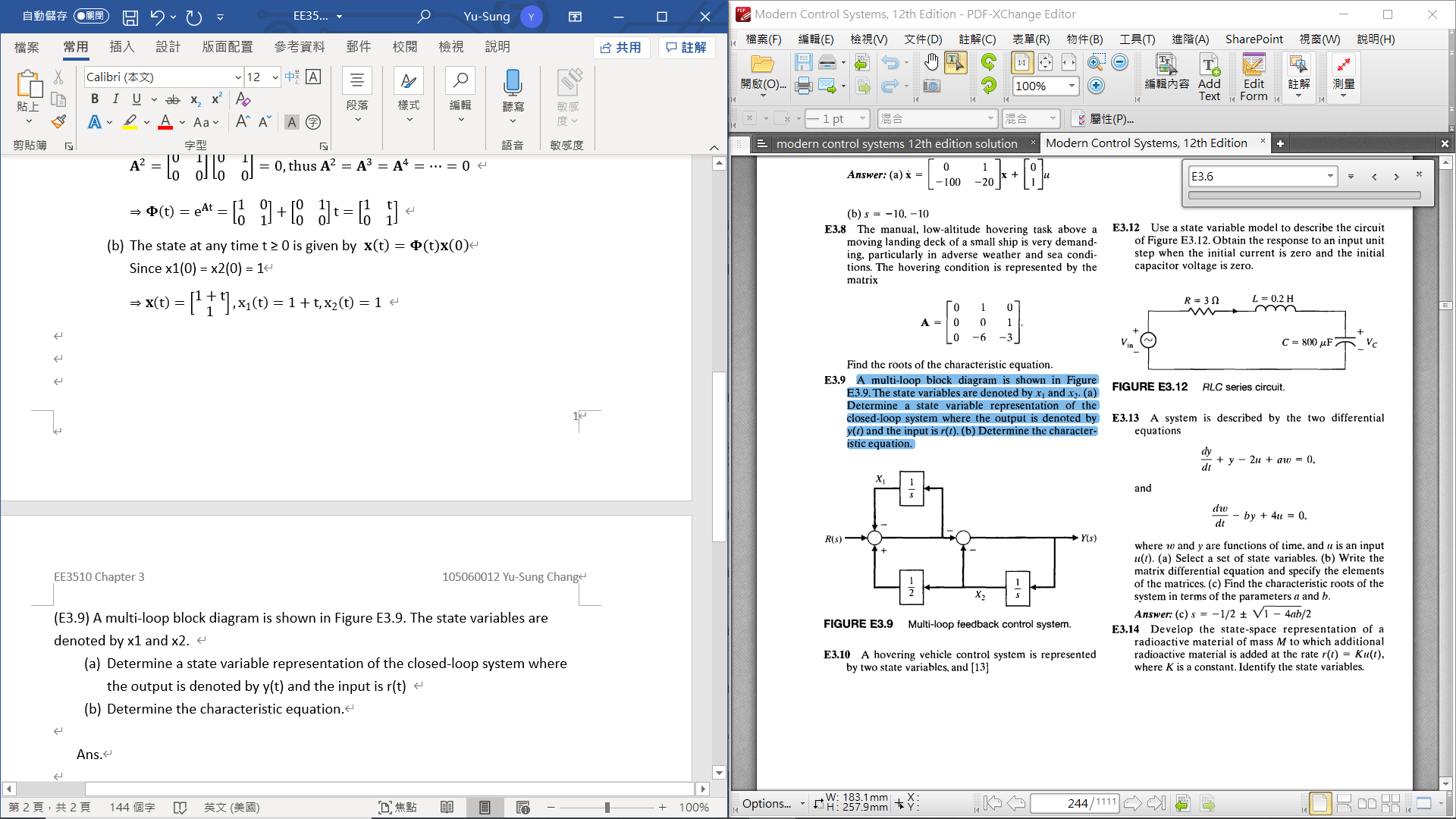
1. The state transition matrix is

1. The state at any time t ≥ 0 is given by

Since x1(0) = x2(0) = 1

(E3.9) A multi-loop block diagram is shown in Figure E3.9. The state variables are denoted by x1 and x2.

1. Determine a state variable representation of the closed-loop system where the output is denoted by y(t) and the input is r(t)
2. Determine the characteristic equation.



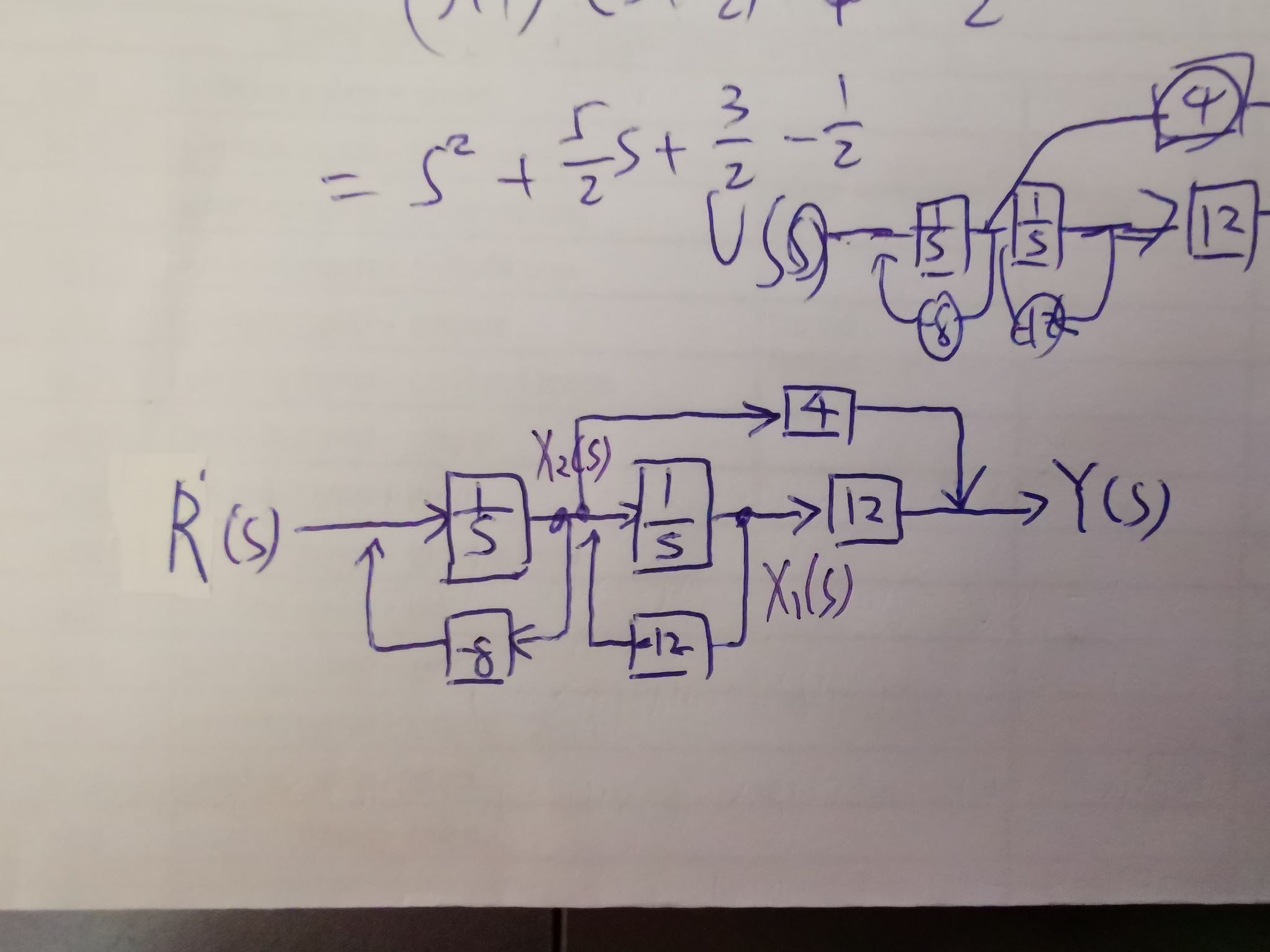
Ans.

* + - In state-variable form

1. The characteristic equation

(E3.11) Determine a state variable representation for the system described by the transfer function

Ans.

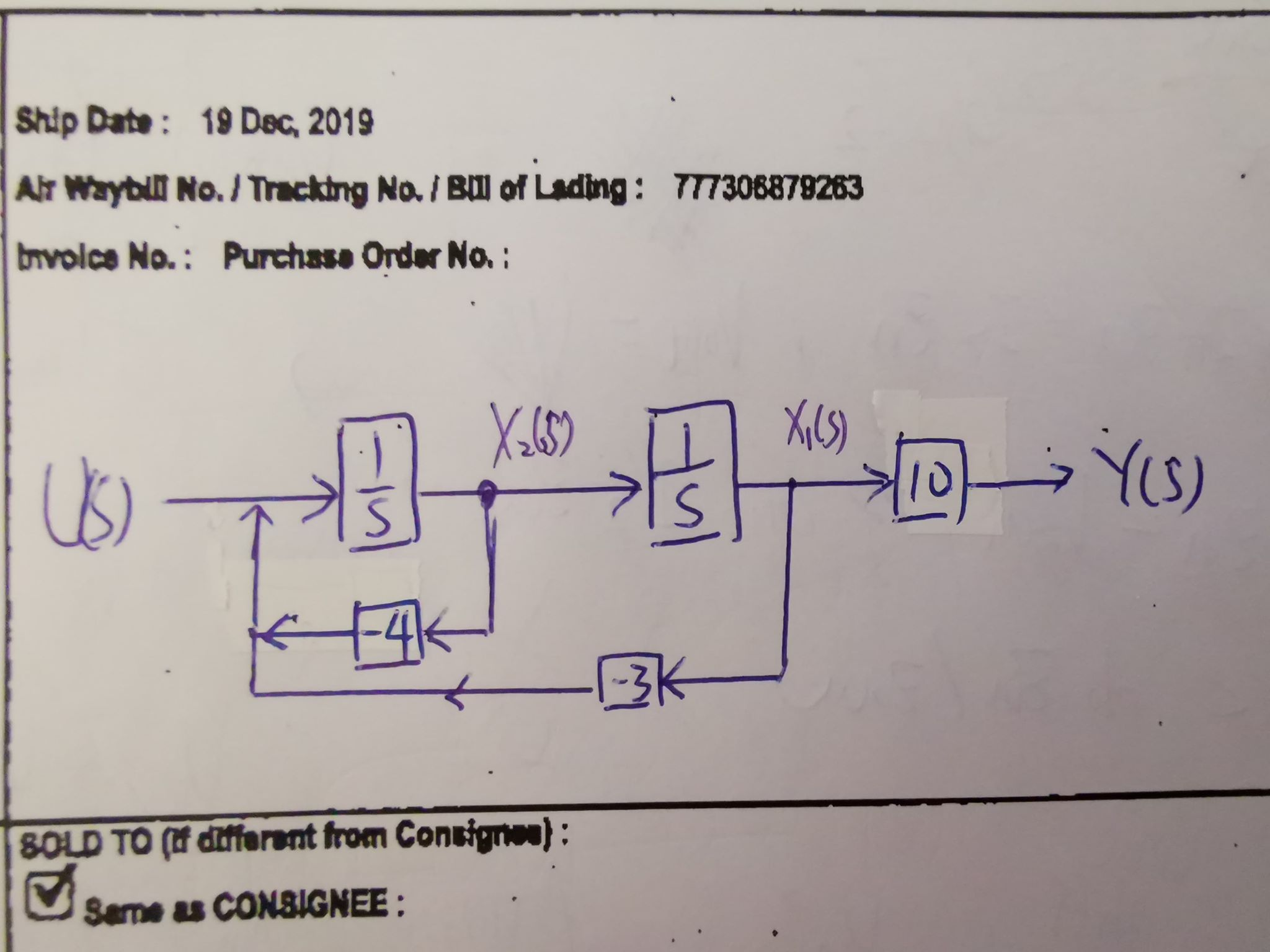




(E3.19) A single-input, single-output system has the matrix equations

Determine the transfer function G(s) = Y(s)/U(s).

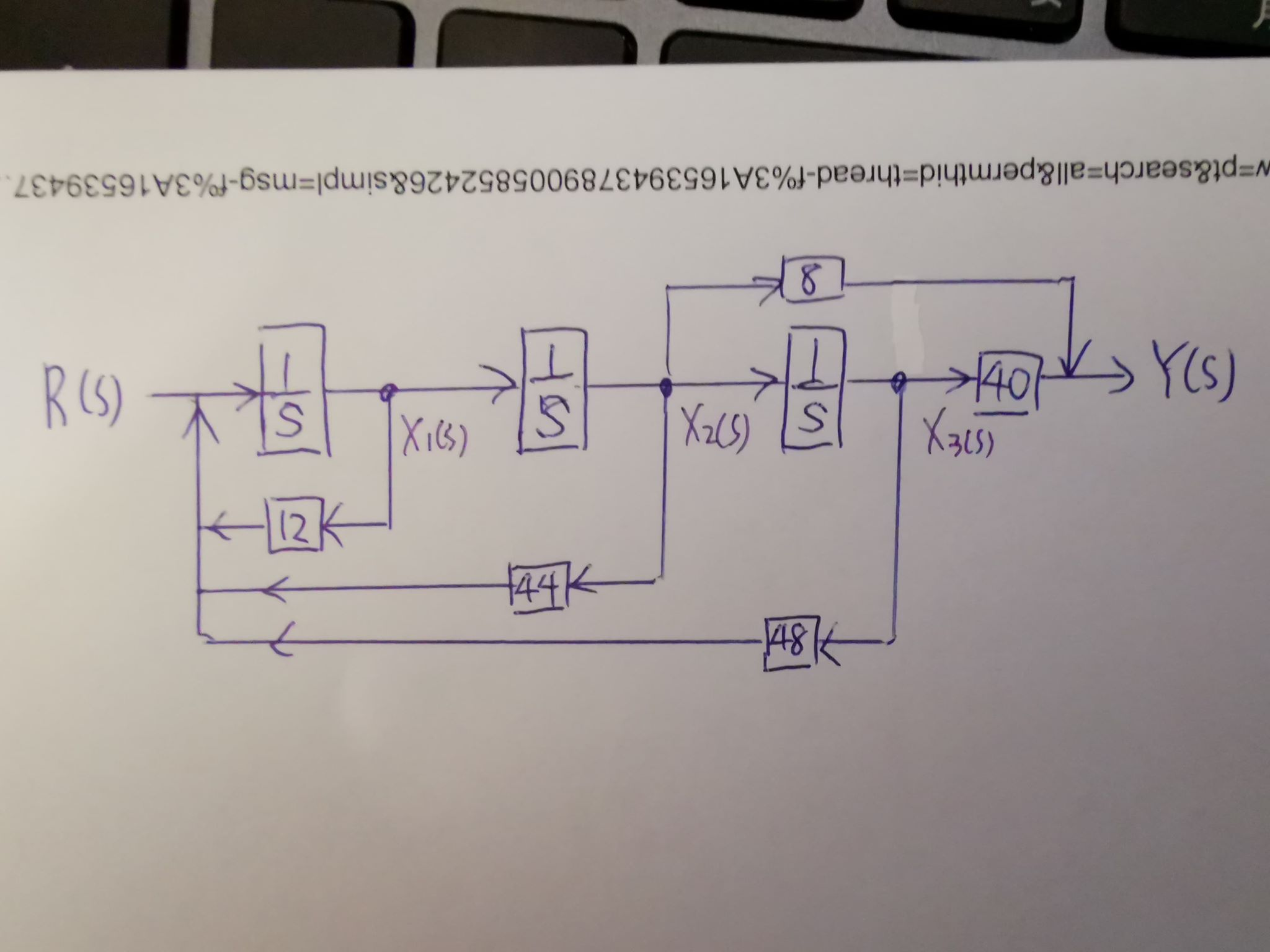
Ans.



(P3.12) A system is described by its transfer function

1. Determine a state variable model.
2. Determine , the state transition matrix.

Ans.



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**-**

**3**

**1**

