SECTIONS 3.1 – 3.4

When solving the ODE

$$ax'' + bx' + cx = 0,$$

find the roots to the characteristic polynomial $ar^2 + br + c$. There are three cases:

Roots are real and distinct:

Roots are complex conjugates:

Roots are real and repeated:
Sections 3.1 – 3.4
Sections 3.1 – 3.4
Sections 3.1 – 3.4

Find the solution to $x'' - x' - 2x = 0$, $x(0) = 1$, $x'(0) = 1$. 
Sections 3.1 – 3.4
Sections 3.1 – 3.4
Sections 3.1 – 3.4

Find the solution to $x'' + 4x' + 3x = 0, x(0) = 2, x'(0) = -1$. 
Sections 3.1 – 3.4
Sections 3.1 – 3.4
Sections 3.1 – 3.4

Find the solution to $6x'' - 5x' + x = 0, x(0) = 4, x'(0) = 0$. 
Sections 3.1 – 3.4
Sections 3.1 – 3.4
Sections 3.1 – 3.4

Solve the IVP \( y'' - 2y' + 2y = 0, \ y(0) = 1, \ y'(0) = 0. \)
Sections 3.1 – 3.4
Sections 3.1 – 3.4
Sections 3.1 – 3.4

Solve the IVP $y'' - 2y' + 6y = 0$, $y(0) = 0$, $y'(0) = 1$. 
Sections 3.1 – 3.4
Sections 3.1 – 3.4
Sections 3.1 – 3.4

Solve the IVP \( y'' + 2y' + 2y = 0, \ y(0) = 1, \ y'(0) = 2. \)
Sections 3.1 – 3.4
Sections 3.1 – 3.4
Solve the IVP $y'' - 2y' + y = 0$, $y(0) = 1$, $y'(0) = 0$. 

**Sections 3.1 – 3.4**

Solve the IVP $y'' - 2y' + y = 0$, $y(0) = 1$, $y'(0) = 0$. 

Sections 3.1 – 3.4
Sections 3.1 – 3.4
Sections 3.1 – 3.4

Solve the IVP \( y'' - 2y' + 10y = 0, \ y(0) = 2, \ y'(0) = 0. \)
Sections 3.1 – 3.4
Sections 3.1 – 3.4
Solve the IVP \( x'' - 5x' + 6x = 2e^t, \ x(0) = 1, \ x'(0) = 0. \)
Sections 3.1 – 3.4
Sections 3.1 – 3.4
Sections 3.1 – 3.4

Solve the IVP $x'' + 2x' + x = 3e^{-t}$, $x(0) = 1$, $x'(0) = 1$. 
Sections 3.1 – 3.4
Sections 3.1 – 3.4
Sections 3.1 – 3.4

Solve the IVP $x'' + 2x' + x = \cos(2t)$, $x(0) = 1$, $x'(0) = 1$. 
Sections 3.1 – 3.4
Sections 3.1 – 3.4