MAT 2384-Practice Problems on Linear Second Order ODEs with constant coefficients

For each of the following ODEs, Find the General Solution. If an initial condition is given, find also the corresponding particular solution.

1. $4y'' - 20y' + 25y = 0$, $y(0) = 1$, $y'(0) = 2$

2. $y'' + 4\pi y' + 4\pi^2 y = 0$

3. $y'' - y' + \frac{5}{2}y = 0$

4. $y'' - 2y' - 5.25y = 0$

5. $y'' + 4\pi^2 y = 0$

6. $y'' - 2y = 0$

7. $y'' - 2y' - 3y = 0$, $y(0) = 2$, $y'(0) = 14$

8. $y'' + 4y' + 5y = 0$, $y(0) = 2$, $y'(0) = -5$

9. $20y'' + 4y' + y = 0$, $y(0) = 3.2$, $y'(0) = 0$

10. $y'' - 25y = 0$, $y(0) = 0$, $y'(0) = 40$