Вариант 7.

1. $\left(1+x^2\right)y' + y\sqrt{1+x^2} = 0$
2. $\left(x^2+y^2\right)dx - 2xydy = 0$
3. $xy' + y - e^x = 0, y(1) = 0$
4. $y' + y^2\cos x = y\,\mathrm{tg}\,x$
5. $x\left(x^2+y^2-a^2\right)dx + y\left(y^2+x^2+a^2\right)dy = 0$
6. $\left(1+x^2\right)y'' + 2xy' = x, y(1) = y'(1) = \frac{1}{2}$
7. $2yy'' = 1 + (y')^2$
8. $y'' - 4y' + 3y = 0, y(0) = 1, y'(0) = 3$
9. $y''' - 4y' = 0$
10. $y'' - 2y' = 3x + xe^{3x}$
11. $y'' + 2y' - 3y = \cos 2x$
12. $y'' + y = 2\sin x$
13. $y'' - 2y' + 5y = x\cos 2x - x^2\sin 2x$
14. $y'' + 9y = 3\,\mathrm{tg}\,3x$
15. $y^{(IV)} + 4y'' + 4y = -2\cos 2x$