1. $xy^2 y' = y + 1$; $y(3e^2) = 2$

   $\{\dfrac{1}{2}y^2 - y + \ln(y+1) = \ln(x) - 2\}$

2. $y + e^x + xy' = 0$

   $\{xy + e^x = c\}$

3. $1 + (3x - e^{-2y})y' = 0$

   $\{xe^{3y} - e^y = c\}$

4. $y' - \dfrac{3}{x}y = 2x^2$

   $\{y = cx^3 + 2x^3 \ln|x|\}$

5. $yy' = 2x \sec(3y)$; $y(2/3) = \pi/3$

   $\{3y\sin(3y) + \cos(3y) = 9x^2 - 5\}$

6. $y' + \dfrac{1}{x-2}y = 3x$; $y(3) = 4$

   $\{y = x^2 - x - 2\}$

7. $y' = \dfrac{3x - y - 9}{x + y + 1}$

$\{3(x-2)^2 - 2(x-2)(y+3) - (y+3)^2 = c\}$

8. $\dfrac{dy}{dx} = \dfrac{x - e^{-x}}{y + e^y}$

$\{y^2 - x^2 + 2(e^y - e^{-x}) = c\ \}$

9. $y' + \dfrac{2}{x+1} y = 3\ ;\ y(0) = 5$

$\{y = x + 1 + 4(x+1)^{-2}\}$

10. $yx^{y-1} + x^y \ln(x) y' = 0$

$\{x^y = c\}$

11. $y' = \dfrac{x - y + 8}{y - 3x + 2}$

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$(\sqrt{2}-1)\ln(\sqrt{2}+1-\dfrac{y-13}{x-5}) - (\sqrt{2}+1)\ln(\sqrt{2}-1+\dfrac{y-13}{x-5}) - 2\ln(x-5) = c$

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12. $4xy + 6y^2 + (2x^2 + 6xy)y' = 0$

$\{x^4y^2 + 2x^3y^3 = c\}$

13. $xy' + y = x\sin x$

$\{y = \dfrac{1}{x}(c + \sin x) - \cos x\}$

14. $y' - 4y = x - x^2$

$\{y = ce^{4x} + \dfrac{x^2}{4} - \dfrac{x}{8} - \dfrac{1}{32}\}$

15. $y' = (\cos^2 x)(\cos^2 2y)$

$\{2\tan 2y - 2x - \sin 2x = c\}$

16. $y' = \dfrac{x^2 + 2xy - 4y^2}{x^2 - 8xy - 4y^2}$

$\{x + y = c(x^2 + 4y^2)\}$

17. $y' = -e^{-x}y^2 + y + e^x$

$\{y = e^x + \dfrac{2e^x}{ce^{2x} - 1}\}$

18. $y' = \dfrac{x^2 - y^2}{xy}$

$\{ x^2(x^2 - 2y^2) = c \}$

19. $y' = \dfrac{2x - 5y - 9}{-4x + y + 9}$

$\{ (2x + y - 3)^2 = c(y - x + 3) \}$

20. $(6x + y^2)dx + y(2x - 3y)dy = 0$

$\{ 3x^2 + y^2 x - y^3 = c \}$

21. $xy' + (x - 2)y = 3x^3 e^{-x}$

$\{ y = x^2(c + 3x)e^{-x} \}$