11. $\mu = e^{\int dx} = e^x$, $e^x y = \int e^x \cos(e^x)dx = \sin(e^x) + C$, $y = e^{-x}\sin(e^x) + Ce^{-x}$

12. $\dfrac{dy}{dx} + 2y = \dfrac{1}{2}$, $\mu = e^{\int 2dx} = e^{2x}$, $e^{2x}y = \int \dfrac{1}{2}e^{2x}dx = \dfrac{1}{4}e^{2x} + C$, $y = \dfrac{1}{4} + Ce^{-2x}$

13. $\dfrac{dy}{dx} + \dfrac{x}{x^2+1}y = 0, \mu = e^{\int (x/(x^2+1))dx} = e^{\frac{1}{2}\ln(x^2+1)} = \sqrt{x^2+1}$,

$\dfrac{d}{dx}\left[y\sqrt{x^2+1}\right] = 0$, $y\sqrt{x^2+1} = C$, $y = \dfrac{C}{\sqrt{x^2+1}}$

14. $\dfrac{dy}{dx} + y = -\dfrac{1}{1-e^x}$, $\mu = e^{\int dx} = e^x$, $e^x y = -\int \dfrac{e^x}{1-e^x}dx = \ln|1-e^x| + C$, $y = e^{-x}\ln|1-e^x| + Ce^{-x}$

15. $\dfrac{1}{y}dy = \dfrac{1}{x}dx$, $\ln|y| = \ln|x| + C_1$, $\ln\left|\dfrac{y}{x}\right| = C_1$, $\dfrac{y}{x} = \pm e^{C_1} = C$, $y = Cx$
including $C = 0$ by inspection

16. $\dfrac{dy}{1+y^2} = 2x\,dx, \tan^{-1} y = x^2 + C, y = \tan\left(x^2 + C\right)$

17. $\dfrac{dy}{1+y} = -\dfrac{x}{\sqrt{1+x^2}}dx, \ln|1+y| = -\sqrt{1+x^2} + C_1, 1+y = \pm e^{-\sqrt{1+x^2}}e^{C_1} = Ce^{-\sqrt{1+x^2}}$,
$y = Ce^{-\sqrt{1+x^2}} - 1, C \neq 0$

18. $y\,dy = \dfrac{x^3\,dx}{1+x^4}, \dfrac{y^2}{2} = \dfrac{1}{4}\ln(1+x^4) + C_1, 2y^2 = \ln(1+x^4) + C$, $y = \pm\sqrt{[\ln(1+x^4) + C]/2}$

19. $\left(\dfrac{2(1+y^2)}{y}\right) dy = e^x dx$, $2\ln|y| + y^2 = e^x + C$; by inspection, $y = 0$ is also a solution

20. $\dfrac{dy}{y} = -x\,dx$, $\ln|y| = -x^2/2 + C_1$, $y = \pm e^{C_1}e^{-x^2/2} = Ce^{-x^2/2}$, including $C = 0$ by inspection

21. $e^y dy = \dfrac{\sin x}{\cos^2 x}dx = \sec x\tan x\,dx$, $e^y = \sec x + C$, $y = \ln(\sec x + C)$

22. $\dfrac{dy}{1+y^2} = (1+x)\,dx, \tan^{-1} y = x + \dfrac{x^2}{2} + C$, $y = \tan(x + x^2/2 + C)$

23. $\dfrac{dy}{y^2-y} = \dfrac{dx}{\sin x}, \int\left[-\dfrac{1}{y} + \dfrac{1}{y-1}\right]dy = \int \csc x\,dx$, $\ln\left|\dfrac{y-1}{y}\right| = \ln|\csc x - \cot x| + C_1$,
$\dfrac{y-1}{y} = \pm e^{C_1}(\csc x - \cot x) = C(\csc x - \cot x)$, $y = \dfrac{1}{1 - C(\csc x - \cot x)}, C \neq 0$;
by inspection, $y = 0$ is also a solution, as is $y = 1$.

24. $\dfrac{1}{y}dy = \cos x\,dx, \ln|y| = \sin x + C$, $y = C_1 e^{\sin x}$