1. $\int (x-1)^2 dx = \frac{x^3}{3} - x^2 + x + C$, $x \in R$

2. $\int \frac{1}{(x-1)^2} dx = (*)$, $x = y+1, dx = dy$

3. (*) = $\int y^{-2} dy = -\frac{1}{y} + C = -\frac{1}{x-1} + C$, $x \in R \setminus \{1\}$

4. $\int \frac{2x+5}{x^2+5x+6} dx = \ln\left|x^2+5x+6\right| + C$, $x \in R \setminus \{-3,-2\}$

5. $\int \frac{x^2-1}{x^2+1} dx = \int \frac{x^2+1}{x^2+1} dx - 2\int \frac{1}{x^2+1} dx = x - 2arctg(x) + C$, $x \in R$

6. $\int tg(x) dx = \int \frac{\sin(x)}{\cos(x)} dx = -\ln\left|\cos(x)\right| + C$, $x \in R \setminus \{(2k+1)\pi/2, k \in Z\}$

7. $\int \frac{x^2}{1+x} dx = \int \frac{x^2-1}{x+1} dx + \int \frac{1}{x+1} dx = \int (x-1) dx + \ln|x+1| + C = \frac{x^2}{2} - x + \ln|x+1| + C$,
$x \in R \setminus \{-1\}$

8. $\int \frac{dx}{\sqrt{x+1} - \sqrt{x-1}} = \int \frac{\sqrt{x+1} + \sqrt{x-1}}{2} dx = (*)$, $y = x-1, dy = dx, t = x+1, dy = dx$

(*) = $\frac{1}{2}\int t^{1/2} dt + \frac{1}{2}\int y^{1/2} dy = \frac{1}{3} t^{3/2} + \frac{1}{3} y^{3/2} + C = \frac{1}{3}(x+1)^{3/2} + \frac{1}{3}(x-1)^{3/2} + C, x \geq 1$

9. $\int x\sqrt{2-5x} dx$, $y = 2-5x, dy = -5dx$

$\int x\sqrt{2-5x} dx$

$-\int \frac{2-y}{5} y^{1/2} \frac{1}{5} dy = -0.08\int y^{1/2} dy + 0.04\int y^{3/2} dy = -\frac{0.16}{3}(2-5x)^{3/2} + \frac{0.1}{5}(2-5x)^{5/2} + C$,
$x \leq 2/5$

10. $\int \frac{1}{e^x + e^{-x}} dx = \int \frac{e^x}{e^{2x}+1} dx = \int \frac{2e^x}{2(e^{2x}+1)} dx = \frac{1}{2}\ln\left|e^{2x}+1\right| + C$, $x \in R$

11. $\int xe^{-x} dx = -xe^{-x} + \int e^{-x} dx = -xe^{-x} - e^{-x} + C$, $x \in R$

12. $\int xarctg(x) dx = \frac{x^2}{2} arctg(x) - \frac{1}{2}\int \frac{x^2+1}{x^2+1} dx + \frac{1}{2}\int \frac{1}{x^2+1} dx = \frac{x^2}{2} arctg(x) - \frac{x}{2} + \frac{1}{2} arctg(x) + C$
$x \in R$

13. $\int x^2 \sin 2x dx$, $y = 2x$, $dy = 2dx$,

$\int x^2 \sin 2x dx = \frac{1}{8}\int y^2 \sin y dy = -\frac{1}{8} y^2 \cos y + \frac{1}{4}\int y \cos y dy = -\frac{1}{8} y^2 \cos y + \frac{1}{4} y \sin y + \frac{1}{4}\int \cos y dy + C =$

$= -\frac{1}{2} x^2 \cos 2x + \frac{1}{2} x \sin 2x + \frac{1}{4} \sin 2x + C$, $x \in R$

14.