

33.  $\int \frac{1}{(x-2)^2+1} dx = \tan^{-1}(x-2) + C$
34.  $\int \frac{1}{\sqrt{1-(x-1)^2}} dx = \sin^{-1}(x-1) + C$
35.  $\int \frac{1}{\sqrt{4-(x-1)^2}} dx = \sin^{-1}\left(\frac{x-1}{2}\right) + C$
36.  $\int \frac{1}{16(x+1/2)^2+1} dx = \frac{1}{4} \int \frac{1}{(x+2)^2+1} dx = \frac{1}{4} \tan^{-1}(4x+2) + C$
37.  $\int \frac{1}{\sqrt{(x-3)^2+1}} dx = \ln\left(x-3+\sqrt{(x-3)^2+1}\right) + C$
38.  $\int \frac{x}{(x+1)^2+1} dx$ , let  $u = x+1$ ,  
 $\int \frac{u-1}{u^2+1} du = \int \left(\frac{u}{u^2+1} - \frac{1}{u^2+1}\right) du = \frac{1}{2} \ln(u^2+1) - \tan^{-1} u + C$   
 $= \frac{1}{2} \ln(x^2+2x+2) - \tan^{-1}(x+1) + C$
39.  $\int \sqrt{4-(x+1)^2} dx$ , let  $x+1 = 2 \sin \theta$ ,  
 $= \int 4 \cos^2 \theta d\theta = \int 2(1 + \cos 2\theta) d\theta$   
 $= 2\theta + \sin 2\theta + C = 2 \sin^{-1}\left(\frac{x+1}{2}\right) + \frac{1}{2}(x+1)\sqrt{3-2x-x^2} + C$