6.3 $\int \frac{\sqrt{x}+\sqrt[3]{x}}{\sqrt[4]{x}}dx = \int\left(x^{1/4}+x^{1/12}\right)dx = \frac{x^{5/4}}{5/4} + \frac{x^{13/12}}{13/12} + C = \frac{4\sqrt[4]{x^5}}{5} + \frac{12\sqrt[12]{x^{13}}}{13} + C$, $C\in\mathbb{R}$

6.7 $\int \frac{4-x^2}{3+x^2}dx = \int \frac{-(3+x^2)+7}{3+x^2}dx = -x + \frac{7}{\sqrt{3}}\operatorname{arctg}\left(\frac{x}{\sqrt{3}}\right) + C$, $C\in\mathbb{R}$

6.9 $\int \frac{dx}{x^4-1} = \int\left(\frac{A}{x-1} + \frac{B}{x+1} + \frac{C}{x^2+1}\right)dx$

$A(x+1)(x^2+1)=1$ при $x=1$: $4A=1 \Rightarrow A=\frac{1}{4}$
$B(x-1)(x^2+1)=1$ при $x=-1$: $-4B=1 \Rightarrow B=-\frac{1}{4}$
$C(x+1)(x-1)=1$ при $x=i$: $-2C=1 \Rightarrow C=-\frac{1}{2}$

т.е. $\int\left(\frac{1}{4(x-1)} - \frac{1}{4(x+1)} - \frac{1}{2(x^2+1)}\right)dx = \frac{1}{4}\ln|x-1| - \frac{1}{4}\ln|x+1| - \frac{1}{2}\operatorname{arctg}x + F$, $F\in\mathbb{R}$

6.12 $\int \frac{\sqrt{1+x^2}+\sqrt{1-x^2}}{\sqrt{1-x^4}}dx = \int\left(\frac{1}{\sqrt{1-x^2}} + \frac{1}{\sqrt{1+x^2}}\right)dx = \arcsin x + \ln\left(x+\sqrt{x^2+1}\right) + C$, $C\in\mathbb{R}$

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

$x = \operatorname{sh}t$, $dx = \operatorname{ch}t$: $\int \frac{1}{\sqrt{1+\operatorname{sh}^2t}}\operatorname{ch}t\,dt = \int \frac{\operatorname{ch}t}{\operatorname{ch}t}dt = t = \frac{e^x-e^{-x}}{2}$;

$\operatorname{ch}^2t - \operatorname{sh}^2t = 1$

$2t\cdot e^x = e^{2x}-1$
$x = \ln\left(t+\sqrt{t^2+1}\right)$

6.17 $\int \frac{dx}{\sqrt{2x^2+5}} = \frac{1}{\sqrt{2}}\cdot\ln\left|x+\sqrt{x^2+\frac{5}{2}}\right| + C$, $C\in\mathbb{R}$

$\sqrt{2x^2+5} = \sqrt{2}\left(\sqrt{x^2+\frac{5}{2}}\right)$

6.24 $\int \frac{2^{2x}-1}{2^{x/2}}dx = \int\left(2^{\frac{3x}{2}} - 2^{-\frac{x}{2}}\right)dx = \frac{2}{3}\cdot\frac{2^{\frac{3x}{2}}}{\ln 2} - 2\cdot\frac{2^{-\frac{x}{2}}}{\ln 2} + C$, $C\in\mathbb{R}$

6.25 $\int \sin^2\frac{x}{2}dx = \int \frac{1-\cos x}{2}dx = \frac{1}{2}x - \frac{\sin x}{2} + C$, $C\in\mathbb{R}$

6.28 $\int \frac{\cos 2x}{\sin^2 2x}dx = \int \frac{1}{2t^2}dt = -\frac{1}{2}t^{-1} + C = -\frac{1}{2\sin 2x} + C$, $C\in\mathbb{R}$

$\sin 2x = t$, $x = \frac{\arcsin t}{2}$; $dx = \frac{1}{2\sqrt{1-t^2}}dt = \frac{1}{2\cos 2x}dt$

6.30 $\int \operatorname{ctg}^2x\,dx = \int \frac{t^2}{-(1+t^2)}dt = \int\left(-1+\frac{1}{1+t^2}\right)dt = -\operatorname{ctg}x - \operatorname{arcctg}(\operatorname{ctg}x) =$

$= -\operatorname{ctg}x - x + C$, $C\in\mathbb{R}$

$t = \operatorname{ctg}x$; $x = \operatorname{arcctg}t$
$dx = -\frac{1}{1+t^2}dt$

38	47	82	99
40	61	83	271
42	66	84	269
43	75	89	272
44	81	98	288