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2 a) $\int (3x - 5\,\underbrace{tgx}_{\frac{\sin x}{\cos x}})\,dx = \frac{3x^2}{2} + 5\ln|\cos x| + k$

b) $\int (5\cos x + 3^x)\,dx = 5\sin x + \frac{3^x}{\ln 3} + k.$

c) $\int (3 + tgx - 5\cos x)\,dx = \int (3 + \frac{\sin x}{\cos x} - 5\cos x)\,dx =$

$= -3\ln|\cos x| - 5\sin x + k.$

d) $\int (10^x - 5^x)\,dx = \frac{10^x}{\ln 10} - \frac{5^x}{\ln 5} + k.$

3 a) $\int \frac{3}{x^2+1}\,dx = 3\,\mathrm{arctg}\,x + k$

b) $\int \frac{2x}{x^2+1}\,dx = \ln|x^2+1| + k$

$x^2+1 \quad | \; x^2+1$
$-x^2-1 \quad\quad 1$
-2

c) $\int \frac{x^2-1}{x^2+1}\,dx = \int (1 - \frac{2}{x^2+1})\,dx = x - 2\,\mathrm{arctg}\,x + k.$

d) $\int \frac{(x+1)^2}{x^2+1}\,dx = \int \frac{x^2+2x+1}{x^2+1}\,dx =$

$x^2+2x+1 \quad | \; x^2+1$
$-x^2 \quad -1 \quad\quad 1$
$2x$

$= \int (1 + \frac{2x}{x^2+1})\,dx = x + \ln|x^2+1| + k.$

350) 4) a) $\int\left(\frac{2}{x}+\frac{2}{x^2}\right)dx = 2\int\left(\frac{1}{x}+\frac{1}{x^2}\right)dx = 2\ln|x| - \frac{2}{x} + k.$

b) $\int \frac{dx}{(x-1)^3} = \int (x-1)^{-3}\,dx = \frac{(x-1)^{-3+1}}{-3+1} = \frac{1}{2}\,\frac{1}{(x-1)^2} + k$

c) $\int \frac{x+\sqrt{x}}{x^2}\,dx = \int\left(\frac{1}{x} + x^{1/2-2}\right)dx = \int\left(\frac{1}{x} + x^{-3/2}\right)dx =$

$= \ln|x| + \frac{x^{-3/2+1}}{-3/2+1} + k = \ln k - \frac{2}{\sqrt{x}} + k$

d) $\int \frac{-8}{1+x^2}\,dx = -8\,\operatorname{arctg} x + k$

e) $\frac{1}{2}\int \frac{2\,3x}{1+x^2}\,dx = \frac{3}{2}\ln(1+x^2) + k.$

f) $\int \frac{x^2}{2-x^3}\,dx = -\frac{1}{3}\int \frac{3x^2}{2-x^3}\,dx = -\frac{1}{3}\ln|2-x^3| + k.$

350) 5) a) $\int \frac{3}{3}\,\frac{dx}{3x-4} = \frac{1}{3}\ln|3x-4| + k.$

b) $\int \frac{dx}{(3x-4)^2} = \int (3x-4)^{-2}\,dx = \frac{1}{3}\,\frac{(3x-4)^{-2+1}}{-2+1} + k = -\frac{1}{3}\,\frac{1}{(3x-4)} + k$

c) $\int \sqrt{3x-4}\,dx = \int (3x-4)^{1/2}\,dx = \frac{1}{3}\,\frac{(3x-4)^{1/2+1}}{1/2+1} = \frac{2}{9}(3x-4)^{3/2} + k$

d) $\int \sqrt[5]{\frac{1}{(3x-4)^3}}\,dx = \int (3x-4)^{-3/5}\,dx = \frac{1}{3}\,\frac{(3x-4)^{-3/5+1}}{-3/5+1} = \frac{1}{3}\,\frac{5}{2}(3x-4)^{2/5}$

$= \frac{5}{6}\sqrt[5]{(3x-4)^2} + k.$