rationale machten van x

Vb $x^{\frac{1}{2}}, x^{\frac{5}{3}}, x^{\frac{3}{7}}, \ldots$

$$x = t^{\text{kgv}(2,3,7)} = t^{42}$$

Oef 1 (57)

$$\int \frac{dt}{2\sqrt{t}+\sqrt[3]{t}} = 6\int \frac{u^5}{2u^3+u^2}\,du$$

$t^{\frac{1}{2}}, t^{\frac{1}{3}}$

Stel: $t = u^{\text{kgv}(2,3)} = u^6 \Rightarrow u = \sqrt[6]{t}$

$\sqrt{t} = u^3, \quad \sqrt[3]{t} = u^2$

$dt = 6u^5\,du$

$$= 6\int \frac{u^3}{2u+1}\,du$$

$$= 6\int \left(\frac{1}{2}u^2 - \frac{1}{4}u + \frac{1}{8} - \frac{1/8}{2u+1}\right)du$$

$$= 6\left(\frac{1}{2}\frac{u^3}{3} - \frac{1}{4}\frac{u^2}{2} + \frac{1}{8}u - \frac{1}{8}\frac{1}{2}\int \frac{d(2u+1)}{2u+1}\right)$$

$$= u^3 - \frac{3}{4}u^2 + \frac{3}{4}u - \frac{3}{8}\ln|2u+1| + C$$

$$= \sqrt{t} - \frac{3}{4}\sqrt[3]{t} + \frac{3}{4}\sqrt[6]{t} - \frac{3}{8}\ln\left|2\sqrt[6]{t}+1\right| + C$$

$$\begin{array}{l|l}
u^3 & 2u+1 \\
\hline
-\left(u^3 + \frac{1}{2}u^2\right) & \frac{1}{2}u^2 - \frac{1}{4}u + \frac{1}{8} \\
\quad -\frac{1}{2}u^2 & \text{quotiënt} \\
-\left(-\frac{1}{2}u^2 - \frac{1}{4}u\right) & \\
\quad \frac{1}{4}u & \\
-\left(\frac{1}{4}u + \frac{1}{8}\right) & \\
\quad -\frac{1}{8} \ \text{rest} &
\end{array}$$