

TeX code compiled with `\documentclass{beamer}` using the Amsterdam theme.

```
\begin{document} \begin{frame} The differentiation rule that helps us understand why the Substitution rule works
is: \vskip 20pt \begin{enumerate}[a] \item The product rule. \vskip 10pt \item The chain rule. \vskip 10pt \item The
quotient rule. \vskip 10pt \item All of the above. \end{enumerate} \end{frame} \begin{frame} Find the indefinite
integrals. \begin{columns} \begin{column}{0.5\textwidth} \begin{itemize} \item[\bf (i)] $\displaystyle\int
x^2\sqrt{x^3+21}\,dx$ \vskip 20pt \item[\bf (ii)] $\displaystyle\int \cos^4(\theta)\sin(\theta)\,d\theta$ \vskip 20pt
\item[\bf (iii)] $\displaystyle\int (9t+7)^{2.5}\,dt$ \end{itemize} \end{column} \begin{column}{0.5\textwidth}
\begin{itemize} \item[\bf (iv)] $\displaystyle\int (x+5)\sqrt{10x+x^2}\,dx$ \vskip 20pt \item[\bf (v)]
$\displaystyle\int \frac{z^3}{\sqrt[3]{3+z^4}}\,dz$ \vskip 20pt \item[\bf (vi)] $\displaystyle\int x(8x+7)^8\,dx$
\end{itemize} \end{column} \end{columns} \end{frame} \begin{frame} Find the indefinite integrals and evaluate
the definite integrals. \begin{columns} \begin{column}{0.5\textwidth} \begin{itemize} \item[\bf (i)]
$\displaystyle\int x^3\sqrt{x^2+4}\,dx$ \vskip 20pt \item[\bf (ii)] $\displaystyle\int x^5\sin(x^6)\,dx$ \vskip 20pt
\item[\bf (iii)] $\displaystyle\int \sec^2(\theta)\tan^7(\theta)\,d\theta$ \end{itemize} \end{column}
\begin{column}{0.5\textwidth} \begin{itemize} \item[\bf (iv)] $\displaystyle\int \sqrt{x^5}\sin(2+x^{7/2})\,dx$
\vskip 20pt \item[\bf (v)] $\displaystyle\int \frac{\cos(\pi/x^{29})}{x^{30}}\,dx$ \vskip 20pt \item[\bf (vi)]
$\displaystyle\int \sin(45t)\sec^2(\cos(45t))\,dt$ \end{itemize} \end{column} \end{columns} \end{frame}
\begin{frame} If $f$ is continuous and $\displaystyle\int_0^4 f(x)\,dx=2$, find $\displaystyle\int_0^2 f(2x)\,dx$.
\end{frame} \begin{frame} Evaluate the definite integrals. \begin{columns} \begin{column}{0.5\textwidth}
\begin{itemize} \item[\bf (i)] $\displaystyle\int_0^1 \sqrt[3]{1+7x}\,dx$ \vskip 20pt \item[\bf (ii)]
$\displaystyle\int_0^{\sqrt{14}\pi} x^{13}\cos(x^{14})\,dx$ \vskip 20pt \item[\bf (iii)]
$\displaystyle\int_0^{\pi/10} \cos(5x)\sin(\sin(5x))\,dx$ \end{itemize} \end{column}
\begin{column}{0.5\textwidth} \begin{itemize} \item[\bf (iv)]
$\displaystyle\int_0^{31}\frac{dx}{\sqrt[3]{(1+4x)^2}}$ \vskip 20pt \item[\bf (v)] $\displaystyle\int_9^{10}
x\sqrt{x-9}\,dx$ \end{itemize} \end{column} \end{columns} \end{frame} \end{document}
```

From:

<https://www2.math.binghamton.edu/> - **Department of Mathematics and Statistics, Binghamton University**

Permanent link:

[https://www2.math.binghamton.edu/p/calculus/resources/calculus\\_flipped\\_resources/applications/4.5\\_substitution\\_tex](https://www2.math.binghamton.edu/p/calculus/resources/calculus_flipped_resources/applications/4.5_substitution_tex)

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