

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

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\begin{document} \begin{frame} \large Peeling an orange changes its volume V. What does  $\Delta V$  represent?
\vskip 10pt \begin{enumerate}[a)] \item the volume of the rind. \vskip 10pt \item the surface area of the orange.
\vskip 10pt \item the volume of the "edible part" of the orange. \vskip 10pt \item  $-1$  times (the volume of the
rind). \end{enumerate} \end{frame} \begin{frame} \large Imagine that you increase the dimensions of a square
with side  $x_1$  to a square with side length  $x_2$ . The change in the area of the square,  $\Delta A$ , is
approximated by the differential  $dA$ . Find  $dA$ : \vskip 10pt \begin{enumerate}[a)] \item  $2x_1(x_2-x_1)$  \vskip
10pt \item  $2x_2(x_2-x_1)$  \vskip 10pt \item  $x_1^2-x_2^2$  \vskip 10pt \item  $(x_2-x_1)^2$  \end{enumerate}
\end{frame} \begin{frame} \large Imagine that you increase the dimensions of a square with side  $x_1$  to a
square with side length  $x_2$ . The change in the area of the square,  $\Delta A$ , is approximated by the differential
 $dA=2x_1(x_2-x_1)$  This approximation will result in an \vskip 5pt \begin{enumerate}[a)] \item overestimate
\vskip 10pt \item underestimate \vskip 10pt \item exactly equal \end{enumerate} \end{frame} \begin{frame} Find
the differential of each function: \begin{columns} \begin{column}{0.5\textwidth} \begin{itemize} \item[\bf a)]
 $y=\sqrt{1+x^2}$  \vskip 20pt \item[\bf b)]  $y=x^2\sin(x)$  \end{itemize} \end{column}
\begin{column}{0.5\textwidth} \begin{itemize} \item[\bf c)]  $y=\sec\left(\sqrt{7x}\right)$  \vskip 20pt \item[\bf d)]
 $y=\frac{3-t^2}{3+t^2}$  \end{itemize} \end{column} \end{columns} \end{frame} \begin{frame} \large The
radius of a sphere is measured to be  $84$  inches with a possible error of  $0.5$  inches. \begin{itemize} \item[\bf a)]
Use differentials to estimate the maximum error in the calculated surface area. What is the relative error? \vskip
20pt \item[\bf b)] Use differentials to estimate the maximum error in the calculated volume. What is the relative
error? \end{itemize} \end{frame} \begin{frame} \large Use differentials to estimate the amount of paint needed to
apply a coat of paint  $0.1$  cm thick to hemispherical dome with diameter  $50$  meters. \end{frame}
\begin{frame} \large A window has the shape of a square surmounted by a semicircle. \vskip 15pt The base of the
window is measured as having width  $50$  inches with a possible error in measurement of  $0.1$  inches. \vskip 15pt
Use differentials to estimate the maximum error possible in computing the area of the window. What is the
maximum relative error? \end{frame} \end{document}

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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/differentials_tex.html

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