

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

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\begin{document} \begin{frame} Find the linearization of each function: \vskip 5pt \begin{itemize} \item[\bf a)]
a = -1. \vskip 20pt \item[\bf b)]  $f(x) = \sin^2(x)$  at  $a = \frac{\pi}{2}$ . \vskip 20pt
\item[\bf c)]  $g(x) = \frac{1}{(1+3x)^4}$  at  $a = 0$ . \vskip 20pt \item[\bf d)]  $r(t) = t^{\frac{3}{4}}$  at
 $a = 16$ . \end{itemize} \end{frame} \begin{frame} \large Use a linear approximation to estimate the value of
 $\sqrt[3]{9}$ . \vskip 30pt Use a linear approximation to estimate the value of  $\tan(44^\circ)$ . \end{frame}
\begin{frame} \large The line tangent to the graph of  $f(x) = \sin(x)$  at the point  $(0,0)$  is  $y=x$ . This implies that
\vskip 10pt \begin{enumerate}[a)] \item  $\sin(0.0005) \approx 0.0005$  \vskip 10pt \item The line  $y=x$  touches
the graph of  $f(x) = \sin(x)$  at exactly one point,  $(0,0)$ . \vskip 10pt \item  $y=x$  is the best straight line
approximation to the graph of  $f$  for all  $x$ . \end{enumerate} \end{frame} \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)]
 $y = \sec(\sqrt{7x})$  \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:
<http://www2.math.binghamton.edu/> - Binghamton University Department of Mathematical Sciences

Permanent link:
http://www2.math.binghamton.edu/p/calculus/resources/calculus_flipped_resources/calculus/calculus_flipped_resources/calculus_flipped_resources/applications/2.9_linearization_differentials_tex.html

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