TeX code compiled with \documentclass{beamer} using the Amsterdam theme.
There are four png images needed to compile slides:

contour1.png

contour2.png

astroid.png

lemniscate.png

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\begin{document} \begin{frame} \large Draw a graph of $x=\sin y$ and find the slope of the line tangent to the graph at the point $(0,\pi)$. \vskip 45pt Find $dx/dy$ and $dy/dx$ if $y\sec(x) = 6x\tan(y)$. \end{frame} \begin{frame} \large Find $dy/dx$ by implicit differentiation. \vskip 15pt \begin{columns} \begin{column}{0.5\textwidth} \begin{enumerate} \item[\bf a)] $x^4+y^3=1$ \vskip 30pt \item[\bf b)] $7x^2 + 5xy - y^2 = 6$ \vskip 30pt \item[\bf c)] $x^7(x + y) = y^2(4x ? y)$ \end{enumerate} \end{column} \begin{column}{0.5\textwidth} \begin{enumerate} \item[\bf d)] $4 \cos(x) \sin(y) = 2$ \vskip 30pt \item[\bf e)] $5y\sin(x^2) = 9x\sin(y^2)$ \vskip 30pt \item[\bf f)] $\sqrt{7x+y}=6+x^2y^2$ \end{enumerate} \end{column} \end{columns} \end{frame} \begin{frame} \large Explain (without calculating) why the two following equations will yield the same formula for $dy/dx$. Does this mean that the two graphs will have exactly the same tangent lines? $$ x^3y+y^2+y=1$$ $$ x^3y+y^2+y=-1$$ \begin{columns} \begin{column}{0.5\textwidth} \includegraphics[height=5cm]{contour1.png} \end{column} \begin{column}{0.5\textwidth} \includegraphics[height=5cm]{contour2.png} \end{column} \end{columns} \end{frame} \begin{frame} \large Find an equation of the tangent line to the ellipse $$9x^2 + xy + 9y^2 = 19$$ at the point $(1, 1)$. \vskip 20pt Find an equation of the tangent line to the {\bf astroid} $x^{2/3}+y^{2/3} = 4$ at $(-3\sqrt{3},1)$. \begin{center} \includegraphics[height=4cm]{astroid.png} \end{center} \end{frame} \begin{frame} \large Find the points on the {\bf lemniscate} $8(x^2+y^2)^2=25(x^2-y^2)$ where the tangent is horizontal. \begin{figure}[htp] \centering{ \includegraphics[height=4cm]{lemniscate.png}} \end{figure} \end{frame} \begin{frame} \large If $f(x) + x^2[f(x)]^3 = 10$ and $f(1) = 2$, find $f '(1)$. \vskip 50pt Find $dx/dy$ and $dy/dx$ and $dz/dx$ if $$y\sec(z) = 6x\tan(y).$$ \end{frame} \begin{frame} \large Find $y''$ by implicit differentiation. $$4x^2+y^2=9$$ \end{frame} \begin{frame} \large When we introduced the Power Rule, we explained it for $y=x^n$ when $n$ is a nonnegative integer, and we promised that later we'd explain it when $n$ is a rational and/or negative number. The moment has come. In the following, you should use the Power Rule {\bf only for $n$ a nonnegative integer} to prove it the Power Rule for all rational numbers. \begin{enumerate}[a)] \item Warm-up: write $y=x^\frac{2}{3}$ as $y^3=x^2$. Then use Implicit Differentiation to show $y'=\frac{2}{3}x^{-\frac{1}{3}}$. \item Let $y=x^\frac{p}{q}$, where $p$ and $q$ are positive integers. Use the same method as the previous problem to show $y'=\frac{p}{q}x^{\frac{p}{q}-1}$. \item Warm-up: write $y=x^{-1}$ as $xy=1$. Then use Implicit Differentiation to show $y'=-x^{-2}$. \item Let $y=x^{-a}$, where $a$ is a positive rational number. Use the same method as the previous problem to show $y'=-ax^{-a-1}$. \end{enumerate} \end{frame} \begin{frame} \large When you solve for $y'$ in an implicit differentiation problem, you have to solve a quadratic equation \begin{enumerate} \item always \item sometimes \item never \end{enumerate} \end{frame} \begin{frame} \large Find equations of both the tangent lines to the ellipse $$x^2 + 9y^2 = 81$$ that pass through the point $(27, 3)$. \end{frame} \begin{frame} \large The Thin Lens Equation in optics relates the focal length $f$ of a lens, the distance $a$ from an object to the lens, and the distance $b$ from the object's image to the lens. The equation is $$\frac{1}{a}+\frac{1}{b}=\frac{1}{f}$$ Let's say you have a lens with focal length $10$ cm. \begin{itemize} \item[\bf (a)] Which of the following derivatives describes the rate at which the position of the image changes as you move the object? \centerline{ $\dfrac{da}{db}$\qquad $\dfrac{db}{da}$\qquad $\dfrac{da}{df}$ \qquad $\dfrac{df}{da}$} \item[\bf (b)] If the object is 20 centimeters
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from the lens and moving away from the lens, where is the object's image and in what direction is it moving? \end{itemize} \end{frame} \end{document}