Math Jeopardy

Chapter 3

# *Math Jeopardy*

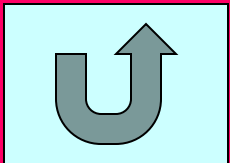| Trig Derivatives | Chain Rule | Inverse Trig | Implicit Different. | Logs and Exponents | ALL MIXED UP |
|---|---|---|---|---|---|
| **$100** | **$100** | **$100** | **$100** | **$100** | **$100** |
| **$200** | **$200** | **$200** | **$200** | **$200** | **$200** |
| **$300** | **$300** | **$300** | **$300** | **$300** | **$300** |
| **$400** | **$400** | **$400** | **$400** | **$400** | **$400** |
| **$500** | **$500** | **$500** | **$500** | **$500** | **$500** |

# *Cat1Help*

Text Object.

Math Type Object

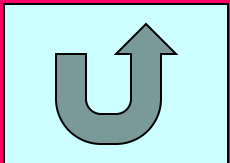Double Click to Edit

# *Cat2Help*

Text Object.


Math Type Object
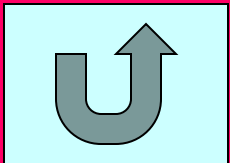
Double Click to Edit

# *Cat3Help*

Text Object.

Math Type Object
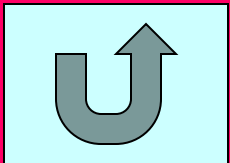
Double Click to Edit

# *Cat4Help*

Text Object.
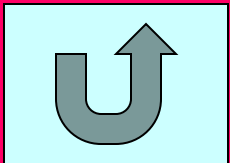

Math Type Object

Double Click to Edit
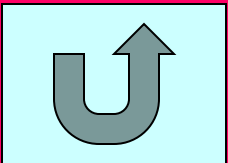
# *Cat5Help*

Text Object.

Math Type Object

Double Click to Edit
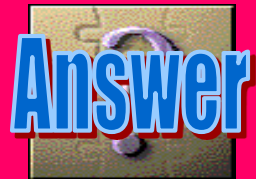
# *Cat6Help*

Text Object.

Math Type Object

Double Click to Edit

# $100

y=csc(3x)

Find y'.

y=csc(3x)
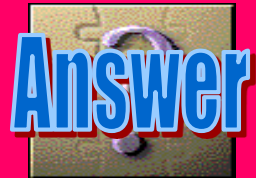
Find y'.

$$y' = -3\csc(3x)\cot(3x)$$

# $200

What is the derivative of
$y = 5\cos(x) - \sec(2x)$ ?

What is the
derivative of

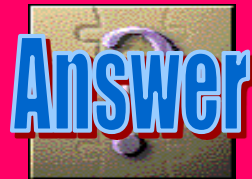$y = 5\cos(x) - \sec(2x)$

$$y' = -5\sin(x) - 2\sec(2x)\tan(2x)$$

# $300

A particle is at $s(t) = \dfrac{\sin(t)}{t}$ for any time, t>0 seconds.

What is its velocity at

t = π/2?  (NO CALCULATOR)

DAILY DOUBLE

Back to Gameboard

Answer

A particle is at
$$s(t) = \frac{\sin(t)}{t}$$
for any time, t>0
seconds.  What is its
velocity at t = π/2?
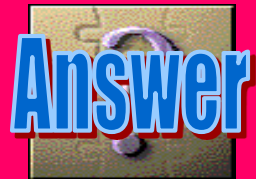
$$v(\frac{\pi}{2}) = \frac{-4}{\pi^2}$$

# $400

$$y = \frac{\cos(4x)}{3x^2} \qquad y' = ?$$

. Simplify your answer.

$$y = \frac{\cos(4x)}{3x^2}$$
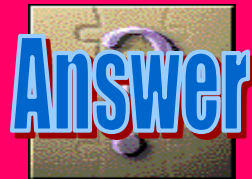
$$y' = \frac{-4x\sin(4x) - 2\cos(4x)}{3x^3}$$

# $500

If $y = \tan(3x)$ find the equation of the normal line to this curve at the point

$$x = \frac{\pi}{4}$$

DAILY DOUBLE

Back to Gameboard

Answer

If $y = \tan(3x)$

find the equation of the normal

line to this curve at the point

x= $\dfrac{\pi}{4}$
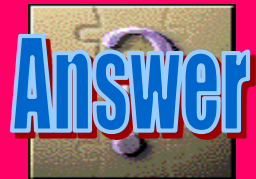
$$y + 1 = \frac{-1}{6}(x - \frac{\pi}{4})$$

$$y = -\frac{1}{6}x + \frac{(\pi - 24)}{24}$$

# $100

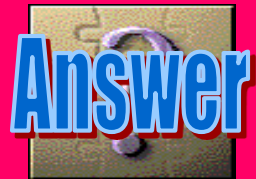$$y = (10x + 4)^5$$

$$y' = ?$$

$$y = (10x + 4)^5$$

$$y' =$$

$$50(10x + 4)^4$$

# $200

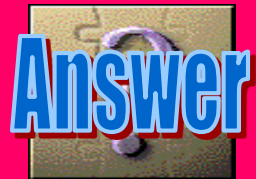$$y = \sqrt[3]{9x^2 + 4}$$

$$y' = ?$$

$y' =$

$$6x(9x^2 + 4)^{-2/3}$$
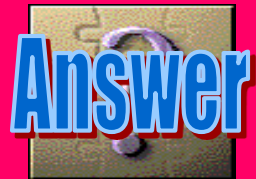
# $300

*Find*

$y'$.

$$y = \sin^3(4t)$$

$$y' = \boxed{12\sin^2(4t)\cos(4t)}$$

# $400

$$y = \left( \frac{1-2v}{1+v} \right)^3 \quad y' = ?$$
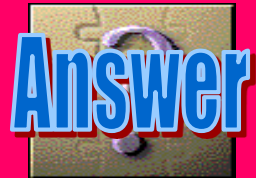
$$y' = \frac{-9(1-2v)^2}{(v+1)^4}$$

# $500

Given the curve:

$$y = (4x - 3)^5 (x + 2)$$

Find the equation of the line tangent at x = 1.

Given the curve:

$$y = (4x - 3)^5 (x + 2)$$

Find the equation of the line tangent to x = 1.

$$y - 3 = 61(x - 1)$$

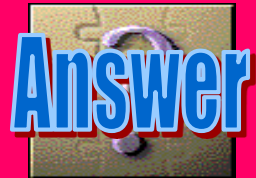$$y = 61x - 58$$

# $100

$$y = \sin^{-1}(5x)$$

$$y' = \ ?$$

$$y = \sin^{-1}(5x)$$

$$y' =$$
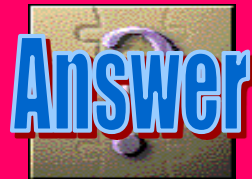
$$\frac{5}{\sqrt{1-25x^2}}$$

# $200

$$y = (\arctan x)^2$$

$$y' = ?$$

$y = (\arctan x)^2$

$y' =$

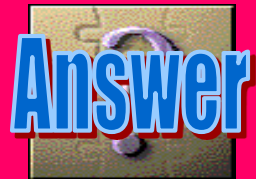$$\dfrac{2\tan^{-1} x}{1+x^2}$$

# $300

Find the derivative of:

$$y = \cot^{-1}(\frac{x}{5}) - \cot^{-1}(x)$$

$$y = \cot^{-1}(\frac{x}{5}) - \cot^{-1}(x)$$

$$y' =$$

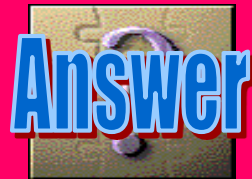$$\frac{-5}{25 + x^2} + \frac{1}{1 + x^2}$$

Back to Problem

30 Points

Back to Gameboard

# $400

$$y = \ln(t^2 + 4) + \frac{1}{2}\tan^{-1}(\frac{t}{2})$$

$$y' = ?$$

Simplify as much as possible.

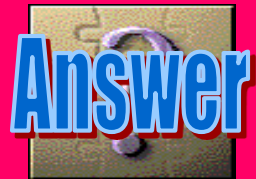$$y = \ln(t^2 + 4) + \frac{1}{2}\tan^{-1}(\frac{t}{2})$$

$$y' =$$

$$\frac{2t + 1}{t^2 + 4}$$

# $500

$$y = 2\sqrt{x-1}(\csc^{-1}\sqrt{x})$$
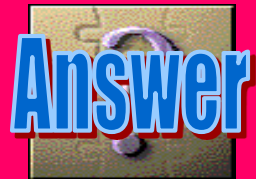
$$y' = ?$$

$$y = 2\sqrt{x-1}(\csc^{-1}\sqrt{x})$$

$$y' = \frac{-1}{x} + \frac{\csc^{-1}\sqrt{x}}{\sqrt{x-1}}$$

# $100

$$4x^2 + 4y^2 = 25$$

Find $\dfrac{dy}{dx}$

$$4x^2 + 4y^2 = 25$$
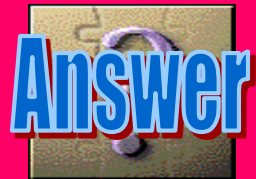
$$\frac{dy}{dx} = \frac{-x}{y}$$

# $200

$$\frac{dy}{dx} = ?$$ when

$$\cos(y) = 3x^2 + y^2$$
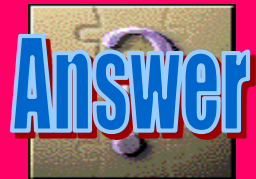
$$\cos(y) = 3x^2 + y^2$$

$$\frac{dy}{dx} = \frac{-6x}{2y + \sin(y)}$$

30 Points

# $300

$$x^2 - xy + y^3 = 1$$

$$\frac{dy}{dx} =$$

$$x^2 - xy + y^3 = 1$$

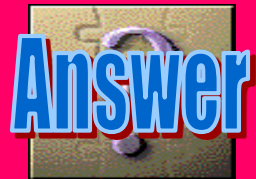$$\frac{dy}{dx} =$$

$$\frac{y - 2x}{3y^2 - x}$$

# $400

$$\frac{4x^2 - y^2}{3y^2 + 4x} = 5y$$

$$\frac{dy}{dx} = ?$$

Hint:  Cross Multiply, then
Take the derivative

$$\frac{4x^2 - y^2}{3y^2 + 4x} = 5y$$

$$\frac{dy}{dx} = ?$$

$$\frac{8x - 20y}{2y + 45y^2 + 20x}$$
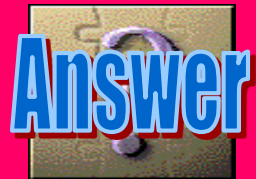
Back to Problem

Back to Gameboard

# $500

When

$$5x^{4/5} + 10y^{6/5} = 15$$

Find the slope of the
Tangent line at x=1.

Answer

When
$5x^{4/5} + 10y^{6/5} = 15$

Find the slope of

the tangent line at
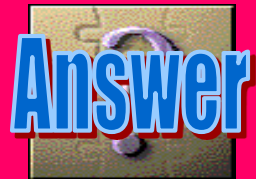x=1.

$$\frac{dy}{dx} = \frac{-4x^{-1/5}}{12y^{1/5}}$$

So slope = -1/3

# $100

$$y = \ln(8x)$$

$$\frac{dy}{dx} = \ ?$$

$y = \ln(8x)$

$\dfrac{dy}{dx} = ?$

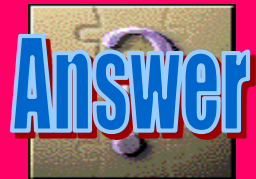$$\dfrac{1}{x}$$

# $200

$$y = \cos(e^{2x})$$

$$\frac{dy}{dx} = ?$$

Answer

$$y = \cos(e^{2x})$$
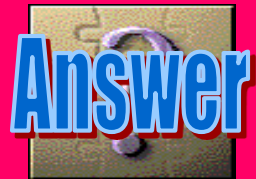
$$\frac{dy}{dx} = -2e^{2x}\sin(e^{2x})$$

# $300

$$y = x^2 e^{(5x)} - \ln(2x+1)$$

$$\frac{dy}{dx} = ?$$

$$y = x^2 e^{(5x)} - \ln(2x+1)$$

$$\frac{dy}{dx} =$$

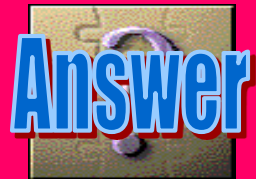$$5x^2 e^{(5x)} + 2xe^{(5x)} - \frac{2}{2x+1}$$

# $400

$$y = \frac{e^x + 2}{e^x - 1}$$

Find the derivative.

$$y = \frac{e^x + 2}{e^x - 1}$$

$$\frac{dy}{dx} = \frac{-3e^x}{(e^x - 1)^2}$$

# $500

Find $y'$

If $y = x^{\ln x}$

$y = x^{\ln x}$

$$\frac{dy}{dx} = \frac{2\ln x(x^{\ln x})}{x}$$

# $100

$$y = e^{\pi}$$

$$\frac{dy}{dx} = ?$$

$$y = e^\pi$$

$$\frac{dy}{dx} =$$

0!!
(it's a constant)

# $200

$$y = \frac{1}{\cos(5x^2 + 3x)}$$

$$\frac{dy}{dx} = ?$$

$$y = \frac{1}{\cos(5x^2 + 3x)}$$

$$\frac{dy}{dx} =$$

$$\frac{\sin(5x^2 + 3x)(10x + 3)}{\cos^2(5x^2 + 3x)}$$

# $300

$$y = \sin^{-1}(\cos x)$$

$$\frac{dy}{dx} = \,?$$

$$y = \sin^{-1}(\cos x)$$

$$\frac{dy}{dx} = ?$$

$$\frac{-\sin(x)}{\sqrt{1 - \cos^2(x)}} = -1!$$

30 Points

# $400

$$y = x^2 + \tan(x) - e^{2x}$$

$$y'(0) = ?$$

$400

$$y = x^2 + \tan(x) - e^{2x}$$

$$y'(0) = ?$$

$$y' = 2x + \sec^2 x - 2e^{2x}$$

$$y'(0) = -1$$

# $500

A particle is following the
Path of

$$x^2 - 10y + 4y^3 = 3$$

Find its velocity at (3,1)

A particle is following the path of

$$x^2 - 10y + 4y^3 = 3$$

Find its velocity at (3,1)

-3m/sec.

30 Points

# Final Jeopardy

Create Question

Here

HELP!

= Answer

Back to Problem

Back to Gameboard
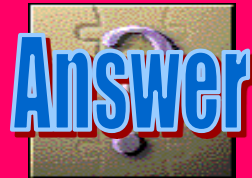
# *Final Jeopardy*

Nice Try.

# Sound and other objects
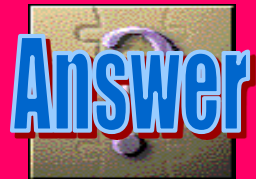
🔊 sn0065A Slot machines

🔊 J0074879 Space Laser

🔊 J0074877 Space Laser 2

🔊 J0097484 Large Explosion

🔊 J0074988 Space Door

**Do Not Delete!**
**Contains objects for game.**

DAILY DOUBLE
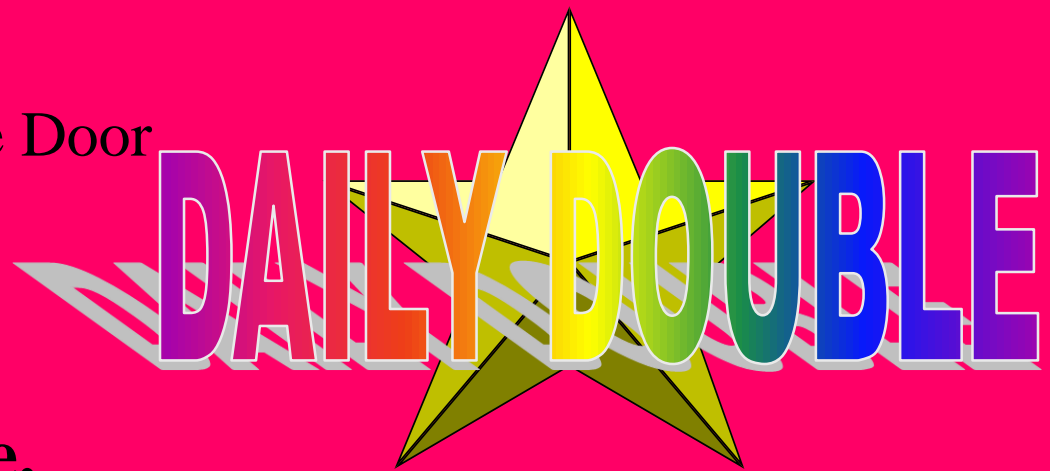
# *Design Credits*

PowerPoint Slide Show created by

Randy Wyatt

Green Hope High School

Morrisville, NC

Adapted from Slide Show by Carol Nata
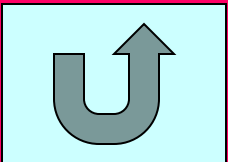
# *Revision History*

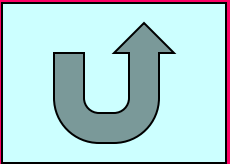Version 4 – June 2003

- Changed points to dollars

- Added link to credits screen by clicking on "Math Jeopardy" on game board

- Changed problems and answers to generic place holders

- Minor color and sound changes on opening game screen

Version 5 – September 2003

- Removed macros and visual basic code

- Rearranged "back to problem" and "back to game board" buttons on answer pages

# Testing Area

# *Help for Teachers*

To create a new set of categories and problems:
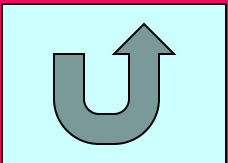
- Update topics on title screen (slide 2)

- Rename category headers on question board (slide 3)

- Change category help slides (immediately following question board)

- Modify questions and answers (answers immediately follow each question slide)

- Cut and Paste Daily Doubles

Tips:

- Questions and answers are MathType objects.  It is easier if you keep it that way.  Even for text problems.

- To put copy of question on the answer slide, copy and paste the MathType object from the question slide then resize.

- The EXIT graphic on the game board will exit WITHOUT saving anything.  It is intended for student use when playing.

- Make sure you test your game to make sure everything is linked and working correctly.

- When playing the intro screen of the game you can click in the lower right corner at any time to skip the intro and go directly to the question board.

Do NOT:

- Change any hyperlinks

Type <ctrl><home> to return to 1st slide