pg 126, 127

6) $\sqrt{x}\cos x + \frac{\sin x}{2\sqrt{x}}$

51) $x^2\sec^2 x + 2x\tan x$

(62) $y = (\tan x)^2$ I: $\tan x$ O: $\sec^2 x$

$2\tan x\sec^2 x$

$y = x^{-1} + (\cos x)^{\frac{1}{2}}$ I: $\cos x$ d: $-\sin x$

$\frac{-1}{x^2} + \frac{1}{2}(\cos x)^{-\frac{1}{2}}(-\sin x)$

pg 137

41 $-3\sin(3x)$

66 undefined

71 $y = 2(x-\pi)$

72 $y + \frac{\sqrt{2}}{2} = -\frac{3\sqrt{2}}{2}(x - \frac{\pi}{4})$

73) $y - 1 = 4(x - \frac{\pi}{4})$

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43 $\frac{\sin x}{2\sqrt{x}} + \sqrt{x}\cos x$

44 $-t^3\sin t + 3t^2\cos t$

o

$y = \frac{1}{x} + \sqrt{\cos x}$

$y = x^{-1} + (\cos x)^{\frac{1}{2}}$ I: $\cos x$ der: $-\sin x$

$-1x^{-2} + \frac{1}{2}(\cos x)^{-\frac{1}{2}}(-\sin x)$

$\frac{-1}{x^2} + \frac{-\sin x}{2\sqrt{\cos x}}$

$\frac{-1}{(\frac{\pi}{2})^2} + \frac{-\sin\frac{\pi}{2}}{2\sqrt{\cos\frac{\pi}{2}}}$ $\frac{(-1)}{0}$

Nov 9-7:36 AM

Name____________________ Worksheet

1) If $y = 2\sin x\cos x$ find y' P.R

$u = 2\sin x$ $v = \cos x$

$u' = 2\cos x$ $v' = -\sin x$

$y' = 2\cos^2 x - 2\sin^2 x$

2) If f(x) = sec(sinx) then f ' (x)= C.R → I: sinx D:

$f'(x) = \sec(\sin x)\tan(\sin x)\cos x$

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3) Differentiate the given function: $f(t) = t^2\sin 2t$ P.R $u=$ $v=$

$u = t^2$ $v = \sin(2t)$ I: 2t D: 2

$u' = 2t$ $v' = 2\cos(2t)$

$2t\sin(2t) + 2t^2\cos(2t)$

4) If $f(x) = \sin(\cos x)$ find $f'(\frac{\pi}{2})$ C.R I: cos x

Chain: I: cos x d: −sin x

$f'(x)$ $\cos(\cos x)(-\sin x)$

$f'\frac{\pi}{2}$ $\cos(\cos\frac{\pi}{2})(-\sin\frac{\pi}{2})$

$\cos(0)$ (-1)

$(1)(-1) = -1$

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I:

C.R → rewrite first

4) If $f(x) = \sin^2(2x)$ the $f'(\frac{\pi}{6})$ =

chain → double I rewrite

$2\sin(2x)\cos(2x)\cdot 2$

$f'(x) = 4\sin(2x)\cos(2x)$

$4\sin\frac{2\pi}{6}\cos\frac{2\pi}{6} \rightarrow 4\sin\frac{\pi}{3}\cdot\cos\frac{\pi}{3}$

$4(\frac{\sqrt{3}}{2})(\frac{1}{2}) = \sqrt{3}$

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5) If y=tanx then $\frac{d^2y}{dx^2}$ =

$\frac{dy}{dx} = \sec^2 x$

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

$u = \sec x$
$u' = \sec x\tan x$

$\frac{d^2y}{dx^2} = (2\sec x)\cdot\sec x\tan x$

$\frac{d^2y}{dx^2} = 2\sec^2 x\tan(x)$

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6) Find the indicated derivative of the given function f(t)= sint +cost , f ‴(t)= → 3 times

$f'(t) = \cos t - \sin t$

$f''(t) = -\sin t - \cos t$

$f'''(t) = -\cos t + \sin t$

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Implicit P.R. $u=2\cos x \quad v=\sin y$
$v'=\cos y\,\frac{dy}{dx}$

* 7) Evaluate the derivative of 2cosxsiny=1 at the point $(0, \frac{\pi}{6})$

$u=2\cos x \quad v=\sin y$
$u'=-2\sin x \quad v'=\cos y\,\frac{dy}{dx}$

Implicit

$-2\sin x\sin y + 2\cos x\cos y\,\frac{dy}{dx} = 0$

$\frac{2\cos x\cos y}{2\cos x\cos y}\frac{dy}{dx} = \frac{2\sin x\sin y}{2\cos x\cos y}$

$\frac{dy}{dx}(0,\frac{\pi}{6}) = \tan(0)\tan(\frac{\pi}{6})$
$= 0$

8) If x + siny =y² then dy/dx =

$1+\cos y\,\frac{dy}{dx} = 2y\,\frac{dy}{dx}$

$\frac{(\cos y-2y)}{\cos y-2y}\frac{dy}{dx} = \frac{-1}{\cos y-2y}$

$\frac{dy}{dx} = \frac{-1}{(\cos y-2y)}$

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Implicit → chain on right side (p.r → parenthesis)

9) If y= cos(xy) then dy/dx =

I: xy
der: $u=x \quad v=y$
$u'=1 \quad v'=\frac{dy}{dx}$
$y+x\frac{dy}{dx}$

$\frac{dy}{dx} = -\sin(xy)\left(y+x\frac{dy}{dx}\right)$

$\frac{dy}{dx} = -y\sin(xy) - x\sin(xy)\frac{dy}{dx}$

$\frac{(1+x\sin(xy))}{1+x\sin(xy)}\frac{dy}{dx} = \frac{y\sin(xy)}{1+\sin(xy)}$

10) Find the tangent line to f(x)=2sinx+cos2x at $(\pi,1)$

C.R.

$f'(x) = 2\cos x - 2\sin 2x$

$y-1$

$f'(\pi) = 2\cos\pi - \cancel{2\sin 2\pi}$
$2(-1) = -2 \rightarrow$ slope

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Nov 6-7:05 AM