APCalculusAB
Wednesday,October2,2013

Bellwork...ontheboard
MorewithTrigDerivatives
PSAT
APDeclare

Bellwork:Findthederivativeofeach:

1.f(x)=sin(2x)

2.g(x)=2sinxcosx

3.h(x)=(tanx)^2

① Let $u=2x \rightarrow \sin u$

$u'(\cos u)$

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

Similar: $y=(2x)^{3/4}$

$y'=\frac{3}{4}(2x)^{-1/4}\cdot 2$

$f(x)=\sin(2x)$

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

Ex. Find y' if $y=2x^{4/5}(2x^3-4x-3)$

Product Rule

$y'=2x^{4/5}(6x^2-4)+(2x^3-4x-3)\left(\frac{8}{5}x^{-3/5}\right)$

2nd BW: $g(x)=2\sin x\cos x$

$g'(x)=2\sin x(-\sin x)+\cos x(2\cos x)$

$g'(x)=-2\sin^2 x+2\cos^2 x$

$g'(x)=2(\cos^2 x-\sin^2 x)$

$g'(x)=2\cos 2x$

Why are the derivatives of sin2x and 2sinxcosx equal?

$\sin 2x=2\sin x\cos x$

③ $h(x)=(\tan x)^2$

inner $=\tan x=u$

outer $=u^2$

$h'(x)=2(\tan x)'(\sec^2 x)$

a) $y = 2\sin x$ b) $y = \sin 2x$ c) $y = 2\sin 2x$ d) $y = \sin^2 x$

e) $y = \sin^2(2x)$ f) $y = \sin\sqrt{x}$ g) $y = \sqrt{\sin x}$ h) $y = \sqrt{\sin 2x}$

(c) $y = 2\sin 2x$ (f) $y = \sin\sqrt{x}$

(d) $y = \sin^2 x$ (g) $y = \sqrt{\sin x}$

(e) $y = \sin^2(2x)$ (h) $y = \sqrt{\sin 2x}$

(c) $y = 2\sin(2x)$

$y' = 2[\cos(2x)\cdot 2]$

$y' = 4\cos(2x)$

(d) $y = \sin^2 x = (\sin x)^2$

$y' = 2(\sin x)^1 \cdot (\cos x)$

$y' = 2\sin x\cos x$ OR $\sin 2x$

(e) $y = \sin^2(2x) = [\sin(2x)]^2$

$y' = 2[\sin(2x)]^1 \cdot 2\cdot\cos(2x)$

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

(f) $y = \sin\sqrt{x}$

$y' = (\cos\sqrt{x})\cdot \frac{1}{2}x^{-1/2}$

$y' = \frac{\cos\sqrt{x}}{2\sqrt{x}}$

(g) $y = \sqrt{\sin x} = (\sin x)^{1/2}$

$y' = \frac{1}{2}(\sin x)^{-1/2}\cdot\cos x$

$y' = \frac{\cos x}{2\sqrt{\sin x}}$

(h) $y = \sqrt{\sin(2x)} = [\sin(2x)]^{1/2}$

$y' = \frac{1}{2}[\sin(2x)]^{-1/2}\cdot 2\cos(2x)$

$y' = \frac{\cos(2x)}{\sqrt{\sin(2x)}}$