

AP Calculus BC
Unit 8 – Integration Techniques

Day 2 Notes: Inverse Trig Functions - Differentiation

$$\frac{d}{dx}[\arcsin u] = \frac{u'}{\sqrt{1-u^2}}$$

$$\frac{d}{dx}[\arccos u] = \frac{-u'}{\sqrt{1-u^2}}$$

$$\frac{d}{dx}[\arctan u] = \frac{u'}{1+u^2}$$

$$\frac{d}{dx}[\operatorname{arccot} u] = \frac{-u'}{1+u^2}$$

$$\frac{d}{dx}[\operatorname{arcsec} u] = \frac{u'}{|u|\sqrt{u^2-1}}$$

$$\frac{d}{dx}[\operatorname{arccsc} u] = \frac{-u'}{|u|\sqrt{u^2-1}}$$

<p>Example 1: $\frac{d}{dx}[\arcsin(2x)]$</p>	<p>Example 2: $\frac{d}{dx}[\arctan(3x)]$</p>
<p>Example 3: $\frac{d}{dx}[\arcsin\sqrt{x}]$</p>	<p>Example 4: $\frac{d}{dx}[\operatorname{arcsec}e^{2x}]$</p>
<p>Example 5: Differentiate $y = \arcsin x + x\sqrt{1-x^2}$</p>	

AP Calculus BC
Unit 8 – Day 2 – Assignment

Name: _____

1. 2003 #1 (AB but suitable for BC) - No Calc: If $y = (x^3 + 1)^2$, then $\frac{dy}{dx} =$

- a. $(3x^2)^2$ c. $2(3x^3 + 1)$ e. $6x^2(x^3 + 1)$
b. $2(x^3 + 1)$ d. $3x^2(x^3 + 1)$

2. 2003 #9 (AB & BC) - No Calc: If $f(x) = \ln(x + 4 + e^{-3x})$, then $f'(0)$ is

- a. $-\frac{2}{5}$ c. $\frac{1}{4}$ e. nonexistent
b. $\frac{1}{5}$ d. $\frac{2}{5}$

3. 2003 #1 (BC) - Calc OK: If $y = \sin(3x)$, then $\frac{dy}{dx} =$

- a. $-3 \cos(3x)$ c. $-\frac{1}{3} \cos(3x)$ e. $3 \cos(3x)$
b. $-\cos(3x)$ d. $\cos(3x)$

4. 1997 #4 (BC) - No Calc: $\frac{d}{dx} \left(x e^{\ln x^2} \right) =$

- a. $1 + 2x$ c. $3x^2$ e. $x^2 + x^3$
b. $x + x^2$ d. x^3

5. 1997 #5 (BC) - No Calc: If $f(x) = (x - 1)^{\frac{3}{2}} + \frac{e^{x-2}}{2}$, then $f'(2) =$

- a. 1 c. 2 e. $\frac{3+e}{2}$
b. $\frac{3}{2}$ d. $\frac{7}{2}$

