

## 5.4 Day 2 Opener New

Wednesday, February 4, 2015  
7:07 AM

### AP Calculus AB 5.4 Day 2 opener

Name \_\_\_\_\_

Use Calculator to check answers only.

1) Evaluate the integral:

a.  $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} (-\csc^2 x) dx$

b.  $\int_4^1 \frac{x^2 - x^4}{2x^4} dx$

2) Find the area between the curve  $g(x) = x^2 - x$  and the x-axis on the interval  $[-1, 1]$ .

3) If  $f(x) = \sqrt{9 - x^2}$  and  $F(0) = 4$ , find  $F(3)$ .

4) Find the derivative:

a)  $\int_{-2}^x \tan r dr$

$$\boxed{\frac{dy}{dx} = \tan x}$$

b)  $\int_0^{3x} (t^2 - 1) dt$

$$\begin{aligned} \frac{dy}{dx} &= ((3x)^2 - 1) \cdot 3 \\ &= (9x^2 - 1) \cdot 3 \\ &= \boxed{27x^2 - 3} \end{aligned}$$

c)  $\int_0^{x^2} \ln(1+t) dt$

$$\begin{aligned} &= \int_0^{x^2} \ln(1+t) dt - \int_0^x \ln(1+t) dt \\ \frac{dy}{dx} &= \ln(1+x^2)(2x) - \ln(1+x) \\ &= \boxed{2x \ln(1+x^2) - \ln(1+x)} \end{aligned}$$

