Sheet #491 ANTIDERIVATIVES

NAME: KEY

Period: ____

1.

a) $\frac{d}{dx}(\ln(x)) = \boxed{\frac{1}{x}}$

b) $\frac{d}{dx}\left(\frac{1}{x}\right) = \boxed{\frac{-1}{x^2}}$

2. IF $f(x) = F'(x)$, FIND THE GENERAL ANTIDERIVATIVE $F(x)+C$ IF

a)	$f(x) = 0$	$F(x) = C$
b)	$f(x) = 3$	$F(x) = 3x + C$
c)	$f(x) = x^2$	$F(x) = x^3/3 + C$
d)	$f(x) = 5x^4$	$F(x) = x^5 + C$
e)	$f(x) = \cos x$	$F(x) = \sin(x) + C$
f)	$f(x) = \frac{1}{x}$	$F(x) = \ln(x) + C$
g)	$f(x) = \ln(x)$	$F(x) = x\ln(x) - x + C$
h)	$f(x) = \frac{1}{x^2}$	$F(x) = \frac{-1}{x} + C$
i)	$f(x) = \sec^2 x$	$F(x) = \tan(x) + C$
j)	$f(x) = \sin(2x)$	$F(x) = -\frac{1}{2}\cos(2x) + C$
k)	$f(x) = 6(x+3)^5$	$F(x) = (x+3)^6 + C$
l)	$f(x) = (2x+7)^5$	$F(x) = \frac{1}{12}(2x+7)^6 + C$
m)	$f(x) = e^{\sin x}\cdot\cos(x)$	$F(x) = e^{\sin(x)} + C$

3. FIND THE GENERAL SOLUTION, $y(x)$.

$\frac{dy}{dx} = \frac{x^3}{3}$ $\qquad \boxed{y = \frac{x^4}{12} + C}$

4. FIND THE PARTICULAR SOLUTION, $y(t)$, IF $y(0) = 5$

$\frac{dy}{dt} = t^2 + t + 1$ $\qquad y = \frac{t^3}{3} + \frac{t^2}{2} + t + c$

$5 = c$

$\boxed{y(t) = \frac{t^3}{3} + \frac{t^2}{2} + t + 5}$

5. FIND THE POSITION FUNCTION, $s(t)$, IF $s(0) = 1$, $v(0) = 2$.

$a = 5\ ft/sec^2$. $\qquad v(t) = 5t + c_1$

$2 = c_1$

$v(t) = 5t + 2$ $\rightarrow$ $s(t) = \frac{5}{2}t^2 + 2t + c_2$

$1 = c_2$

$\boxed{s(t) = \frac{5}{2}t^2 + 2t + 1}$