Tear-off Reference Sheet for Final Exam

Rules for Derivatives and Other Useful Facts

$(x^n)' = nx^{n-1}$ for any real n	$\left(\sqrt{x}\right)' = \frac{1}{2\sqrt{x}}$	$(\sin x)' = \cos x \quad (\cos x)' = -\sin x$
$(b^x)' = (\ln b)b^x$ for any $b > 0$	$(e^x)' = e^x$	$(\ln x)' = \frac{1}{x}$
$(cf)' = cf'$ for constant c $(f \pm g)' = f' \pm g'$	$[f(g(x))]' = f'(g(x))g'(x)$	$(fg)' = f'g + g'f \quad \left(\frac{f}{g}\right)' = \frac{f'g - g'f}{g^2}$

Trigonometric Identities

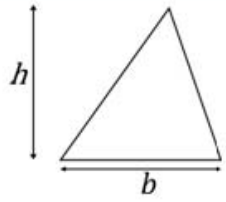
$\tan x = \frac{\sin x}{\cos x}$	$\cot x = \frac{\cos x}{\sin x}$	$\sec x = \frac{1}{\cos x}$	$\csc x = \frac{1}{\sin x}$	$\sin^2 x + \cos^2 x = 1$

Geometry: Angles in Radians; P = perimeter, A = area or surface area, V = volume

TRIANGLE

$P = a + b + c$

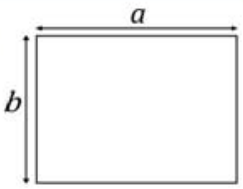
$A = \frac{1}{2}bh$



RECTANGLE

$P = 2a + 2b$

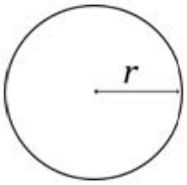
$A = ab$



CIRCLE

$P = 2\pi r$

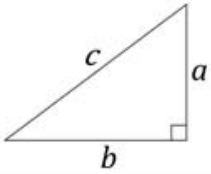
$A = \pi r^2$



PYTHAGOREAN THEOREM

$a^2 + b^2 = c^2$

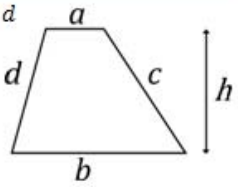
$c = \sqrt{a^2 + b^2}$



TRAPEZOID

$P = a + b + c + d$

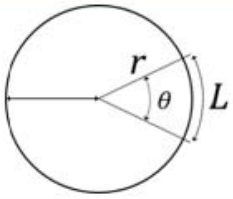
$A = h\frac{a+b}{2}$



CIRCULAR SECTOR

$L = r\theta$

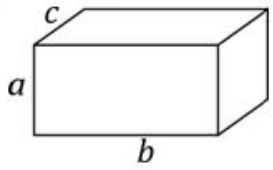
$A = \frac{1}{2}r^2\theta$



RECTANGULAR BOX

$A = 2ab + 2ac + 2bc$

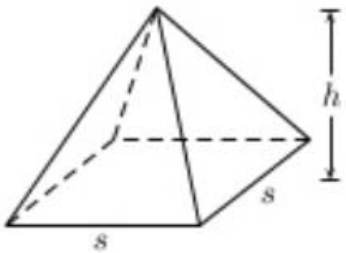
$V = abc$



SQUARE PYRAMID

$A = s(s + \sqrt{s^2 + 4h^2})$

$V = \frac{1}{3}s^2h$

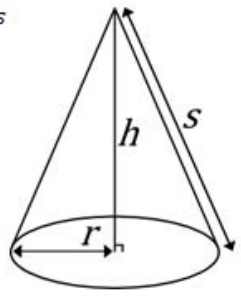


RIGHT CIRCULAR CONE

$A = \pi r^2 + \pi rs$

$s = \sqrt{r^2 + h^2}$

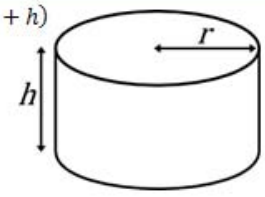
$V = \frac{1}{3}\pi r^2 h$



CYLINDER

$A = 2\pi r(r + h)$

$V = \pi r^2 h$



SPHERE

$A = 4\pi r^2$

$V = \frac{4\pi r^3}{3}$

TABLE OF INDEFINITE INTEGRALS

$$\int cf(x)\,dx = c\int f(x)\,dx$$

$$\int [f(x) + g(x)]\,dx = \int f(x)\,dx + \int g(x)\,dx$$

$$\int k\,dx = kx + C$$

$$\int \frac{f'(x)}{f(x)}\,dx = \ln|f(x)| + C$$

$$\int x^n\,dx = \frac{x^{n+1}}{n+1} + C \quad (n \neq -1)$$

$$\int \frac{1}{x}\,dx = \ln|x| + C$$

$$\int e^x\,dx = e^x + C$$

$$\int a^x\,dx = \frac{a^x}{\ln a} + C$$

$$\int \sin x\,dx = -\cos x + C$$

$$\int \cos x\,dx = \sin x + C$$

$$\int \sec^2 x\,dx = \tan x + C$$

$$\int \csc^2 x\,dx = -\cot x + C$$

$$\int \sec x \tan x\,dx = \sec x + C$$

$$\int \csc x \cot x\,dx = -\csc x + C$$

$$\int \frac{1}{x^2+1}\,dx = \tan^{-1}x + C$$

$$\int \frac{1}{\sqrt{1-x^2}}\,dx = \sin^{-1}x + C$$