Definitions and Formulas for Mathematics 4-8

CALCULUS

First Derivative: $f'(x) = \frac{dy}{dx}$

Second Derivative: $f''(x) = \frac{d^2y}{dx^2}$

PROBABILITY

$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$

$P(A \text{ and } B) = P(A)P(B|A) = P(B)P(A|B)$

ALGEBRA

i $\quad i^2 = -1$

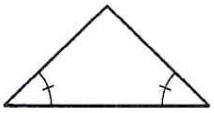
A^{-1} inverse of matrix A

$A = P\left(1 + \frac{r}{n}\right)^{nt}$ Compound interest, where A is the final value, P is the principal, r is the interest rate, t is the term, n is the number of divisions within the term

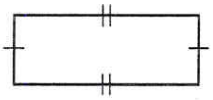
$[x] = n$ Greatest integer function, where n is the integer such that $n \leq x < n + 1$

GEOMETRY

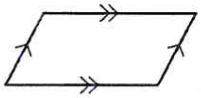
Congruent Angles



Congruent Sides



Parallel Sides



Circumference of a Circle

$C = 2\pi r$

VOLUME

Cylinder: (area of base) × height

Cone: $\frac{1}{3}$ (area of base) × height

Sphere: $\frac{4}{3}\pi r^3$

Prism: (area of base) × height

AREA

Triangle: $\frac{1}{2}$ (base × height)

Rhombus: $\frac{1}{2}$ (diagonal$_1$ × diagonal$_2$)

Trapezoid: $\frac{1}{2}$ height (base$_1$ + base$_2$)

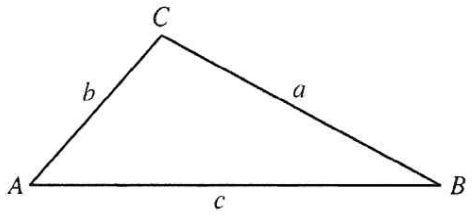
Sphere: $4\pi r^2$

Circle: πr^2

Lateral surface area of cylinder: $2\pi rh$

TRIGONOMETRY

Law of Sines: $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$



Law of Cosines:

$c^2 = a^2 + b^2 - 2ab \cos C$

$b^2 = a^2 + c^2 - 2ac \cos B$

$a^2 = b^2 + c^2 - 2bc \cos A$

END OF DEFINITIONS AND FORMULAS