TMTH 111
MIDTERM FORMULA SHEET

CHAPTER 1: *Numerical Computation*

Distance = Rate × Time Amount = Rate × Base (where rate is in decimal form)

$$\%\ change = \frac{new\ value - original\ value}{original\ value} \times 100 \qquad \%\ error = \frac{Measured\ Value - Known\ value}{Known\ value} \times 100$$

$$\%\ efficiency = \frac{output}{input} \times 100 \qquad \%\ conc.\ of\ A = \frac{Amount\ of\ A}{Total\ Amount\ of\ Mixture} \times 100$$

Metric Prefixes.

10^{12}	10^{9}	10^{6}	10^{3}	10	10^{-1}	10^{-2}	10^{-3}	10^{-6}	10^{-9}	10^{-12}
tera	giga	mega	kilo	deca	deci	centi	milli	micro	nano	pico

CHAPTER 6: *Geometry*

NAME	FORMULA
Circle	Circumference = $2\pi r$ or πd
	Area = πr^2 or $\frac{\pi d^2}{4}$
Square	Perimeter = $4s$
	Area = s^2
Rectangle	Perimeter = $2(l + w)$
	Area = $l \cdot w$
Parallelogram	Perimeter = $2(a + b)$
	Area = $b \cdot h$
Rhombus	Perimeter = $4s$
	Area = $s \cdot h$
Trapezoid	Perimeter = $a + b + c + d$
	Area = $\frac{(a+b)\cdot h}{2}$
Triangle	Area = $\frac{b\cdot h}{2}$
Hero's Formula	Area = $\sqrt{s(s-a)(s-b)(s-c)}$ where $s = \frac{a+b+c}{2}$

NAME	FORMULA
Cube	Volume = a^3
	Surface Area = $6a^2$
Rectangular Parallelepiped	Volume = lwh
	Surface Area = $2(lw + hw + lh)$
Any cylinder or prism	Volume = (area of base)·(altitude)
Right cylinder or prism	Lateral Area = (perimeter of base) · (altitude) (not including bases)
Sphere	Volume = $\frac{4}{3}\ \pi r^3$
	Surface area = $4\pi r^2$
Any cone or pyramid	Volume = $\frac{h}{3}$• (area of base)
Right circular cone or regular pyramid	Lateral area = $\frac{s}{2}$• (perimeter of base)
Frustum	Volume = $\frac{h}{3}$ • $(A_1 + A_2 + \sqrt{A_1 A_2})$
Frustum	Lateral area = $\frac{s}{2}$• (sum of base perimeters) = $\frac{s}{2}$• $(P_1 + P_2)$

<u>CHAPTER 7</u>: ***Right Triangles and Vectors***

$1 \text{ rev} = 360° = 2\pi$ radians 1 radian = 57.3° $c^2 = a^2 + b^2$

$\sin\theta = \frac{\text{opp}}{\text{hyp}}$ $\cos\theta = \frac{\text{adj}}{\text{hyp}}$ $\tan\theta = \frac{\text{opp}}{\text{adj}}$

$\csc\theta = \frac{1}{\sin\theta}$ $\sec\theta = \frac{1}{\cos\theta}$ $\cot\theta = \frac{1}{\tan\theta}$

<u>CHAPTER 15</u>: ***Oblique Triangles and Vectors***

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

Law of Cosines:

$a^2 = b^2 + c^2 - 2bc \cdot \cos A$ or $\cos A = \frac{b^2+c^2-a^2}{2bc}$

$b^2 = a^2 + c^2 - 2ac \cdot \cos B$ or $\cos B = \frac{a^2+c^2-b^2}{2ac}$

$c^2 = a^2 + b^2 - 2ab \cdot \cos C$ or $\cos C = \frac{a^2+b^2-c^2}{2ab}$