Math 20-1 Formula Sheet

Quadratic Functions and Equations

Standard form

$$y = ax^2 + bx + c$$

Vertex form

$$y = a(x-p)^2 + q$$

Absolute Value

$$|x| = \begin{cases} x \text{ if } x \geq 0 \\ -x \text{ if } x < 0 \end{cases}$$

The Quadratic Formula

$$ax^2 + bx + c = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Sequences

Arithmetic Sequence

$$t_n = t_1 + (n-1)d$$

$$S_n = \frac{n}{2}\left[2t_1 + (n-1)d\right]$$

$$S_n = \frac{n}{2}\left[t_1 + t_n\right]$$

Geometric Sequence

$$t_n = t_1 \times r^{n-1}$$

$$S_n = \frac{t_1(r^n - 1)}{r - 1} \text{ , } r \neq 1$$

$$S_n = \frac{r \times t_n - t_1}{r - 1} \text{ , } r \neq 1$$

Convergent Series

$$S_\infty = \frac{t_1}{1 - r} \text{ , } |r| < 1$$

n = the number of terms in the series

Trigonometry
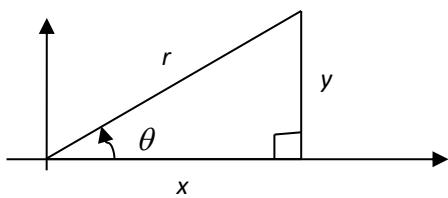
Trigonometric Relations and Pythagorean Law

$$\sin\theta = \frac{y}{r} \qquad \cos\theta = \frac{x}{r} \qquad \tan\theta = \frac{y}{x}$$

$$x^2 + y^2 = r^2$$

For triangle ABC:
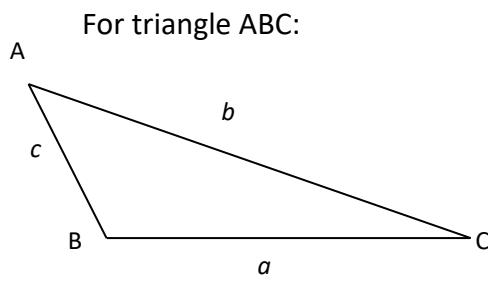
Sine Law: $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

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

Cosine Law: *or*

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

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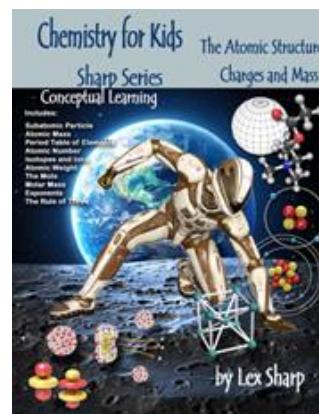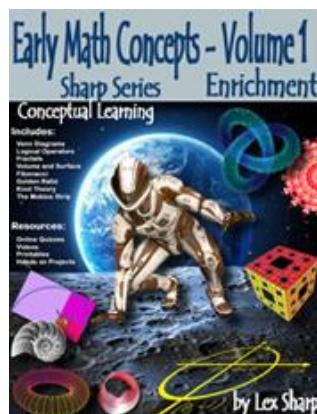
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