In all that follows, a, b, c, c_1 and c_2 are arbitrary real constants, and f and g are functions.
n is any positive integer.
r is any rational number.
The notation $\pm$ means "plus or minus", and $\mp$ is "minus or plus". When used in the same equations, these symbols retain their ordering. E.g., $\pm x = \mp 3$ means both "$+x = -3$" and "$-x = +3$".

Trigonometric identities and alues:

$$\sin(a \pm b) = \sin a \cos b \pm \cos a \sin b \qquad \cos(a \pm b) = \cos a \cos b \mp \sin a \sin b$$

$$\sin(2a) = 2 \sin a \cos a \qquad \cos(2a) = \cos^2 a - \sin^2 a$$

$$\sin^2 a + \cos^2 a = 1$$

$$\sin 0 = \cos \frac{\pi}{2} = 0 \qquad \sin \frac{\pi}{2} = \cos 0 = 1$$

$$\sin \frac{\pi}{6} = \cos \frac{\pi}{3} = \frac{1}{2} \qquad \sin \frac{\pi}{3} = \cos \frac{\pi}{6} = \frac{\sqrt{3}}{2}$$

$$\sin \frac{\pi}{4} = \cos \frac{\pi}{4} = \frac{1}{\sqrt{2}}$$

Limits and continuity:

$$\lim_{x \to c} c_1 = c_1 \qquad \lim_{x \to c} x = c$$

$$\lim_{x \to c} (c_1 f(x) \pm c_2 g(x)) = c_1 \lim_{x \to c} f(x) \pm c_2 \lim_{x \to c} g(x) \qquad \lim_{x \to c} f(x) g(x) = \left(\lim_{x \to c} f(x)\right) \left(\lim_{x \to c} g(x)\right)$$

$$\lim_{x \to c} \frac{f(x)}{g(x)} = \frac{\lim_{x \to c} f(x)}{\lim_{x \to c} g(x)} \text{ (Assuming the denominator is not 0)}$$

$$\lim_{x \to 0} \frac{\sin x}{x} = 1 \qquad \lim_{x \to 0} \frac{1 - \cos x}{x} = 0$$

$$\lim_{x \to c} f(g(x)) = f(g(c)) \text{ (Assuming } f \text{ is continuous at } \lim_{x \to c} g(x).)$$

A function f has a vertical asymptote at $x = c$ if $\lim_{x \to c} |f(x)| = \infty$.
A function g has a horizontal asymptote at $y = c$ if $\lim_{x \to +\infty} g(x) = c$ or $\lim_{x \to -\infty} g(x) = c$.

Derivatives:
If f is differentiable at $x = c$, then f is continuous at $x = c$.

$$(x^r)' = r x^{r-1}, \qquad (c_1 f(x) + c_2 g(x))' = c_1 f'(x) + c_2 g'(x)$$

$$(f(x) g(x))' = f'(x) g(x) + g'(x) f(x) \qquad \left(\frac{f(x)}{g(x)}\right)' = \frac{f'(x) g(x) - g'(x) f(x)}{g^2(x)}$$

$$(\sin x)' = \cos x \qquad (\cos x)' = -\sin x$$

$$(\tan x)' = \sec^2 x \qquad (\cot x)' = -\csc^2 x$$

$$(f(g(x)))' = f'(g(x))\, g'(x)$$

Critical points of functions over a closed interval are comprised of the interval endpoints, stationary points, and singular points.
Newton's Method for numerically solving $f(x) = 0$ corresponds to the iteration $x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$.

Sums and integrals:

$$\sum_{i=1}^{n} i = \frac{n(n+1)}{2} \qquad \sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6} \qquad \sum_{i=1}^{n} i^3 = \frac{(n(n+1))^2}{4}$$

If F is an antiderivative of f, then the substitution rule for integrals is,

$$\int f(g(x))g'(x)\,\mathrm{d}x = F(g(x)) + C$$

Areas and volumes:

Area of θ-sector of a circle	:	$\frac{\theta}{2} \times r^2 = \frac{\theta}{2} \times (\text{radius})^2$
Circular arc length sweeping out θ radians	:	$\pi \times \theta$
Volume of a sphere	:	$\frac{4}{3}\pi r^3 = \frac{4\pi}{3}\,(\text{radius})^3$
Volume of a thin cylinder	:	$A \times \Delta h = (\text{Area of base}) \times (\text{height})$
Volume of a thin shell	:	$2\pi r \times h \times \Delta r = (\text{Shell circumference}) \times (\text{height}) \times (\text{thickness})$

Graphs:

- Point-slope form for a line: $y - y_0 = m(x - x_0)$
- Equation of a circle: $(x - x_0)^2 + (y - y_0)^2 = r^2$