

GLOBAL
EDITION



Calculus

SECOND EDITION

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ALGEBRA

Exponents and Radicals

$$x^a x^b = x^{a+b} \quad \frac{x^a}{x^b} = x^{a-b} \quad x^{-a} = \frac{1}{x^a} \quad (x^a)^b = x^{ab} \quad \left(\frac{x}{y}\right)^a = \frac{x^a}{y^a}$$

$$x^{1/n} = \sqrt[n]{x} \quad x^{m/n} = \sqrt[n]{x^m} = (\sqrt[n]{x})^m \quad \sqrt[n]{xy} = \sqrt[n]{x} \sqrt[n]{y} \quad \sqrt[n]{x/y} = \sqrt[n]{x} / \sqrt[n]{y}$$

Factoring Formulas

$$a^2 - b^2 = (a - b)(a + b) \quad a^2 + b^2 \text{ does not factor over real numbers.}$$

$$a^3 - b^3 = (a - b)(a^2 + ab + b^2) \quad a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

$$a^n - b^n = (a - b)(a^{n-1} + a^{n-2}b + a^{n-3}b^2 + \dots + ab^{n-2} + b^{n-1})$$

Binomials

$$(a \pm b)^2 = a^2 \pm 2ab + b^2$$

$$(a \pm b)^3 = a^3 \pm 3a^2b + 3ab^2 \pm b^3$$

Binomial Theorem

$$(a + b)^n = a^n + \binom{n}{1}a^{n-1}b + \binom{n}{2}a^{n-2}b^2 + \dots + \binom{n}{n-1}ab^{n-1} + b^n,$$

$$\text{where } \binom{n}{k} = \frac{n(n-1)(n-2) \cdots (n-k+1)}{k(k-1)(k-2) \cdots 3 \cdot 2 \cdot 1} = \frac{n!}{k!(n-k)!}$$

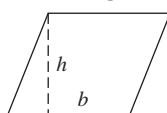
Quadratic Formula

The solutions of $ax^2 + bx + c = 0$ are

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

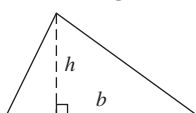
GEOMETRY

Parallelogram



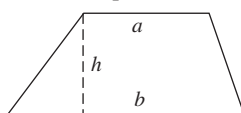
$$A = bh$$

Triangle



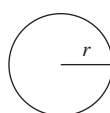
$$A = \frac{1}{2}bh$$

Trapezoid



$$A = \frac{1}{2}(a + b)h$$

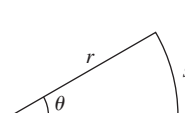
Circle



$$A = \pi r^2$$

$$C = 2\pi r$$

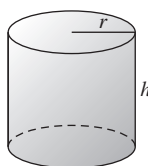
Sector



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

$$s = r\theta \text{ (}\theta \text{ in radians)}$$

Cylinder

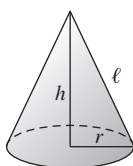


$$V = \pi r^2 h$$

$$S = 2\pi r h$$

(lateral surface area)

Cone

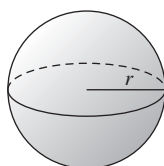


$$V = \frac{1}{3}\pi r^2 h$$

$$S = \pi r \ell$$

(lateral surface area)

Sphere



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

$$S = 4\pi r^2$$

Equations of Lines and Circles

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$y - y_1 = m(x - x_1)$$

$$y = mx + b$$

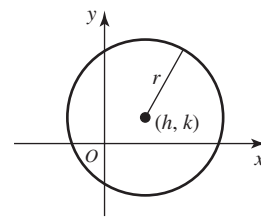
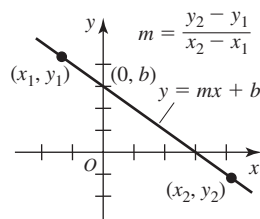
$$(x - h)^2 + (y - k)^2 = r^2$$

slope of line through (x_1, y_1) and (x_2, y_2)

point-slope form of line through (x_1, y_1) with slope m

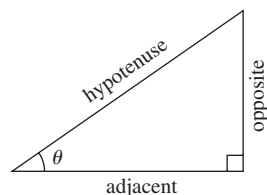
slope-intercept form of line with slope m and y-intercept $(0, b)$

circle of radius r with center (h, k)



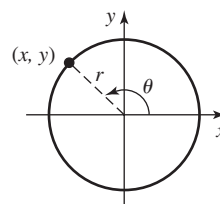
$$(x - h)^2 + (y - k)^2 = r^2$$

TRIGONOMETRY



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

$$\sec \theta = \frac{\text{hyp}}{\text{adj}} \quad \csc \theta = \frac{\text{hyp}}{\text{opp}} \quad \cot \theta = \frac{\text{adj}}{\text{opp}}$$



$$\cos \theta = \frac{x}{r} \quad \sec \theta = \frac{r}{x}$$

$$\sin \theta = \frac{y}{r} \quad \csc \theta = \frac{r}{y}$$

$$\tan \theta = \frac{y}{x} \quad \cot \theta = \frac{x}{y}$$

(Continued)

Calculus, Global Edition

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