GLOBAL EDITION

Calculus

SECOND EDITION

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ALWAYS LEARNING

PEARSON

ALGEBRA

Exponents and Radicals

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

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

Factoring Formulas

$a^2 - b^2 = (a - b)(a + b)$ $\qquad a^2 + b^2$ does not factor over real numbers.

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

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

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

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

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

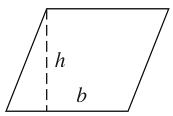
Quadratic Formula

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

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

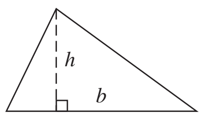
GEOMETRY

Parallelogram



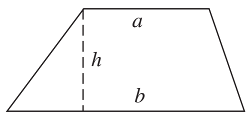
$A = bh$

Triangle



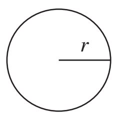
$A = \frac{1}{2}bh$

Trapezoid



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

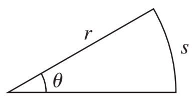
Circle



$A = \pi r^2$

$C = 2\pi r$

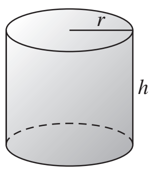
Sector



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

$s = r\theta$ (θ in radians)

Cylinder

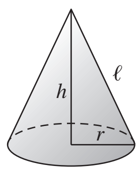


$V = \pi r^2 h$

$S = 2\pi rh$

(lateral surface area)

Cone

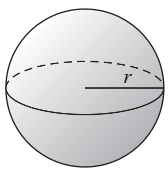


$V = \frac{1}{3}\pi r^2 h$

$S = \pi r\ell$

(lateral surface area)

Sphere

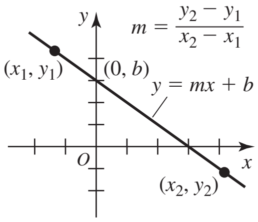


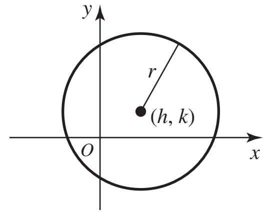
$V = \frac{4}{3}\pi r^3$

$S = 4\pi r^2$

Equations of Lines and Circles

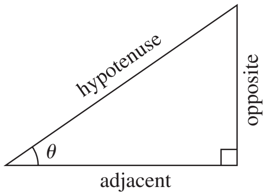
$m = \dfrac{y_2 - y_1}{x_2 - x_1}$	slope of line through (x_1, y_1) and (x_2, y_2)
$y - y_1 = m(x - x_1)$	point–slope form of line through (x_1, y_1) with slope m
$y = mx + b$	slope–intercept form of line with slope m and y-intercept $(0, b)$
$(x - h)^2 + (y - k)^2 = r^2$	circle of radius r with center (h, k)



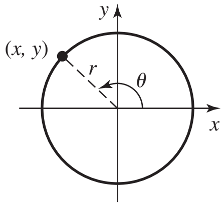


$(x - h)^2 + (y - k)^2 = r^2$

TRIGONOMETRY



$\cos\theta = \dfrac{\text{adj}}{\text{hyp}}$	$\sin\theta = \dfrac{\text{opp}}{\text{hyp}}$	$\tan\theta = \dfrac{\text{opp}}{\text{adj}}$
$\sec\theta = \dfrac{\text{hyp}}{\text{adj}}$	$\csc\theta = \dfrac{\text{hyp}}{\text{opp}}$	$\cot\theta = \dfrac{\text{adj}}{\text{opp}}$



$\cos\theta = \dfrac{x}{r}$	$\sec\theta = \dfrac{r}{x}$
$\sin\theta = \dfrac{y}{r}$	$\csc\theta = \dfrac{r}{y}$
$\tan\theta = \dfrac{y}{x}$	$\cot\theta = \dfrac{x}{y}$

(*Continued*)

Calculus, Global Edition

Table of Contents

Table of Contents

Pearson

Table of Contents

Table of Contents

Table of Contents

Pearson