FORMULES DE DÉRIVATION

1. $c' = 0$
2. $(u+v)' = u' + v'$
3. $(uv)' = uv' + vu'$
4. $\left(\dfrac{u}{v}\right)' = \dfrac{vu' - uv'}{v^2}$
5. $\left[f\big(g(x)\big)\right]' = f'\big(g(x)\big)g'(x)$
6. $(u^n)' = n \cdot u^{n-1} \cdot u'$
7. $(e^u)' = e^u \cdot u'$
8. $(a^u)' = a^u \cdot \ln a \cdot u'$
9. $(\ln|u|)' = \dfrac{1}{u} \cdot u'$
10. $(\log_a|u|)' = \dfrac{1}{u \cdot \ln a} \cdot u'$
11. $(\sin u)' = \cos u \cdot u'$
12. $(\cos u)' = -\sin u \cdot u'$
13. $(\operatorname{tg} u)' = \sec^2 u \cdot u'$
14. $(\operatorname{cotg} u)' = -\operatorname{cosec}^2 u \cdot u'$
15. $(\sec u)' = \sec u \cdot \operatorname{tg} u \cdot u'$
16. $(\operatorname{cosec} u)' = -\operatorname{cosec} u \cdot \operatorname{cotg} u \cdot u'$
17. $(\operatorname{Arc\,sin} u)' = \dfrac{1}{\sqrt{1-u^2}} \cdot u'$
18. $(\operatorname{Arc\,cos} u)' = \dfrac{-1}{\sqrt{1-u^2}} \cdot u'$
19. $(\operatorname{Arc\,tg} u)' = \dfrac{1}{1+u^2} \cdot u'$
20. $(\operatorname{Arc\,sec} u)' = \dfrac{1}{u \cdot \sqrt{u^2-1}} \cdot u'$

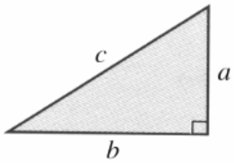
FORMULES D'INTÉGRATION

1. $\int u\,dv = uv - \int v\,du$
2. $\int u^n\,du = \dfrac{1}{n+1} \cdot u^{n+1} + C, n \neq -1$
3. $\int \dfrac{1}{u}\,du = \ln|u| + C$
4. $\int e^u\,du = e^u + C$
5. $\int a^u\,du = \dfrac{1}{\ln a} \cdot a^u + C$
6. $\int \sin u\,du = -\cos u + C$
7. $\int \cos u\,du = \sin u + C$
8. $\int \sec^2 u\,du = \operatorname{tg} u + C$
9. $\int \operatorname{cosec}^2 u\,du = -\operatorname{cotg} u + C$
10. $\int \sec u \cdot \operatorname{tg} u\,du = \sec u + C$
11. $\int \operatorname{cosec} u \cdot \operatorname{cotg} u\,du = -\operatorname{cosec} u + C$
12. $\int \operatorname{tg} u\,du = -\ln|\cos u| + C$
13. $\int \operatorname{cotg} u\,du = \ln|\sin u| + C$
14. $\int \sec u\,du = \ln|\sec u + \operatorname{tg} u| + C$
15. $\int \operatorname{cosec} u\,du = \ln|\operatorname{cosec} u - \operatorname{cotg} u| + C$
16. $\displaystyle\int \frac{1}{\sqrt{a^2-u^2}}\,du = \operatorname{Arc\,sin}\frac{u}{a} + C$
17. $\displaystyle\int \frac{1}{a^2+u^2}\,du = \frac{1}{a} \cdot \operatorname{Arc\,tg}\frac{u}{a} + C$
18. $\displaystyle\int \frac{1}{u \cdot \sqrt{u^2-a^2}}\,du = \frac{1}{a} \cdot \operatorname{Arc\,sec}\frac{u}{a} + C$
19. $\displaystyle\int \frac{1}{a^2-u^2}\,du = \frac{1}{2a} \cdot \ln\left|\frac{u+a}{u-a}\right| + C$
20. $\displaystyle\int \frac{1}{\sqrt{u^2-a^2}}\,du = \ln\left|u + \sqrt{u^2-a^2}\right| + C$

FORMULES DE GÉOMÉTRIE

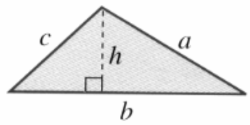
Aire A; périmètre p; volume V; aire de la surface latérale S; hauteur h; rayon r

TRIANGLE RECTANGLE



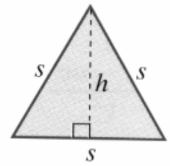
Théorème de Pythagore : $c^2 = a^2 + b^2$

TRIANGLE



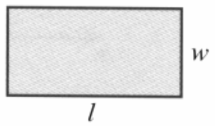
$A = \frac{1}{2}bh \quad p = a + b + c$ 1

TRIANGLE ÉQUILATÉRAL



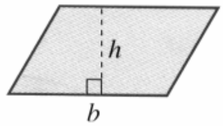
$h = \dfrac{\sqrt{3}}{2}s \quad A = \dfrac{\sqrt{3}}{4}s^2$

RECTANGLE



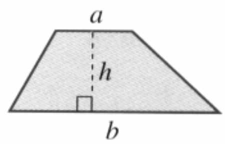
$A = lw \quad C = 2l + 2w$

PARALLÉLOGRAMME



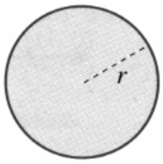
$A = bh$

TRAPÈZE



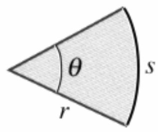
$A = \frac{1}{2}(a + b)h$

CERCLE



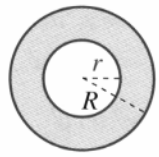
$A = \pi r^2 \quad p = 2\pi r$

SECTEUR CIRCULAIRE



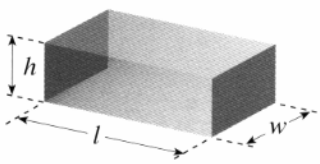
$A = \frac{1}{2}r^2\theta \quad S = r\theta$

ANNEAU CIRCULAIRE



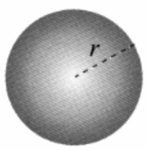
$A = \pi(R^2 - r^2)$

PARALLÉLÉPIPÈDE RECTANGLE



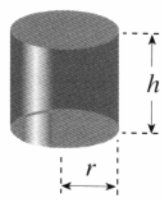
$V = lwh \quad S = 2(hl + lw + hw)$

SPHÈRE



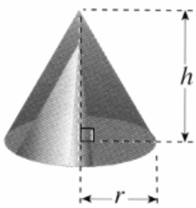
$V = \frac{4}{3}\pi r^3 \quad S = 4\pi r^2$

CYLINDRE CIRCULAIRE DROIT



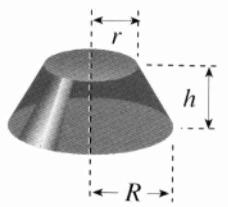
$V = \pi r^2 h \quad S = 2\pi rh$

CÔNE CIRCULAIRE DROIT



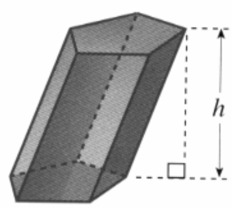
$V = \frac{1}{3}\pi r^2 h \quad S = \pi r\sqrt{r^2 + h^2}$

TRONC DE CÔNE



$V = \frac{1}{3}\pi h(r^2 + rR + R^2)$

PRISME



$V = Bh$ où B est l'aire de la base

ALGÈBRE

EXPOSANTS ET RADICAUX

$a^m a^n = a^{m+n}$ $\qquad a^{m/n} = \sqrt[n]{a^m} = (\sqrt[n]{a})^m$

$(a^m)^n = a^{mn}$ $\qquad \sqrt[n]{ab} = \sqrt[n]{a}\,\sqrt[n]{b}$

$(ab)^n = a^n b^n$ $\qquad \sqrt[n]{\dfrac{a}{b}} = \dfrac{\sqrt[n]{a}}{\sqrt[n]{b}}$

$\left(\dfrac{a}{b}\right)^n = \dfrac{a^n}{b^n}$ $\qquad \sqrt[m]{\sqrt[n]{a}} = \sqrt[mn]{a}$

$\dfrac{a^m}{a^n} = a^{m-n}$ $\qquad a^{-n} = \dfrac{1}{a^n}$

VALEUR ABSOLUE $(d > 0)$

$|x| < d$ si et seulement si $-d < x < d$

$|x| > d$ si et seulement si $x > d$ ou $x < -d$

$|a+b| \leqslant |a| + |b|$ (Inégalité triangulaire)

$-|a| \leqslant a \leqslant |a|$

INÉGALITÉS

Si $a > b$ et $b > c$, alors $a > c$

Si $a > b$, alors $a + c > b + c$

Si $a > b$ et $c > 0$, alors $ac > bc$

Si $a > b$ et $c < 0$, alors $ac < bc$

TRINOME DU SECOND DEGRÉ

Si $a \neq 0$, les racines de $ax^2 + bx + c = 0$ sont

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

LOGARITHMES

$y = \log_a x$ signifie $a^y = x$ $\qquad \log_a 1 = 0$

$\log_a xy = \log_a x + \log_a y$ $\qquad \log_a a = 1$

$\log_a \dfrac{x}{y} = \log_a x - \log_a y$ $\qquad \log x = \log_{10} x$

$\log_a x^r = r \log_a x$ $\qquad \ln x = \log_e x$

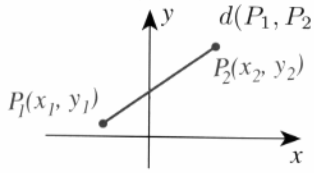
BINÔME DE NEWTON

$$(x+y)^n = x^n + \binom{n}{1} x^{n-1} y + \binom{n}{2} x^{n-2} y^2 + \ldots + \binom{n}{k} x^{n-k} y^k + \ldots + y^n,$$

avec $\dbinom{n}{k} = \dfrac{n!}{k!(n-k)!}$

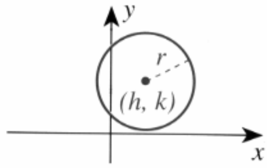
GÉOMÉTRIE ANALYTIQUE

FORMULE DE LA DISTANCE



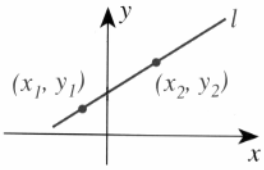
$$d(P_1, P_2) = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

ÉQUATION D'UN CERCLE



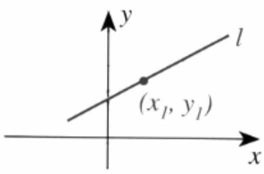
$$(x-h)^2 + (y-k)^2 = r^2$$

PENTE m D'UNE DROITE



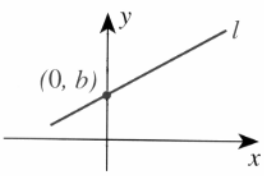
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

ÉQUATION D'UNE DROITE EN FONCTION DE LA PENTE m ET D'UN POINT (x_1, y_1)



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

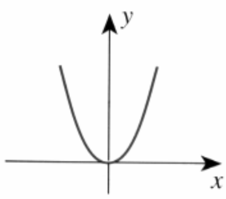
ÉQUATION D'UNE DROITE D'ORDONNÉE A L'ORIGINE b ET DE PENTE m

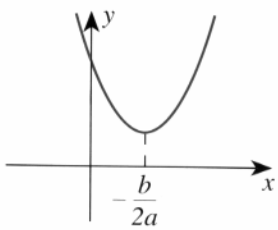


$$y = mx + b$$

GRAPHIQUE D'UNE ÉQUATION DU SECOND DEGRÉ

$y = ax^2, \quad a > 0$ $\qquad y = ax^2 + bx + c, \quad a > 0$

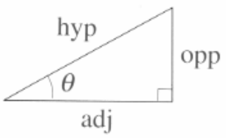




TRIGONOMÉTRIE

FONCTIONS TRIGONOMÉTRIQUES

D'ANGLES AIGUS

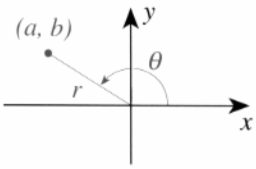


$$\sin\theta = \frac{\text{opp}}{\text{hyp}} \qquad \operatorname{cosec}\theta = \frac{\text{hyp}}{\text{opp}}$$

$$\cos\theta = \frac{\text{adj}}{\text{hyp}} \qquad \sec\theta = \frac{\text{hyp}}{\text{adj}}$$

$$\operatorname{tg}\theta = \frac{\text{opp}}{\text{adj}} \qquad \operatorname{cotg}\theta = \frac{\text{adj}}{\text{opp}}$$

D'ANGLES QUELCONQUES

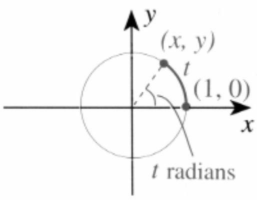


$$\sin\theta = \frac{b}{r} \qquad \operatorname{cosec}\theta = \frac{r}{b}$$

$$\cos\theta = \frac{a}{r} \qquad \sec\theta = \frac{r}{a}$$

$$\operatorname{tg}\theta = \frac{b}{a} \qquad \operatorname{cotg}\theta = \frac{a}{b}$$

DE NOMBRES RÉELS

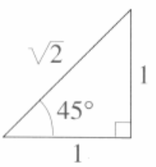


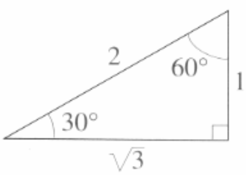
$$\sin t = y \qquad \operatorname{cosec} t = \frac{1}{y}$$

$$\cos t = x \qquad \sec t = \frac{1}{x}$$

$$\operatorname{tg} t = \frac{y}{x} \qquad \operatorname{cotg} t = \frac{x}{y}$$

TRIANGLES PARTICULIERS





VALEURS PARTICULIÈRES

θ deg	θ rad	$\sin\theta$	$\cos\theta$	$\operatorname{tg}\theta$	$\operatorname{cotg}\theta$	$\sec\theta$	$\operatorname{cosec}\theta$
0°	0	0	1	0	–	1	–
30°	$\frac{\pi}{6}$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$	$\sqrt{3}$	$\frac{2\sqrt{3}}{3}$	2
45°	$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1	1	$\sqrt{2}$	$\sqrt{2}$
60°	$\frac{\pi}{3}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$	$\frac{\sqrt{3}}{3}$	2	$\frac{2\sqrt{3}}{3}$
90°	$\frac{\pi}{2}$	1	0	–	0	–	1

IDENTITÉS TRIGONOMÉTRIQUES

$$\operatorname{cosec} t = \frac{1}{\sin t} \qquad \operatorname{tg} t = \frac{\sin t}{\cos t}$$

$$\sec t = \frac{1}{\cos t} \qquad \operatorname{cotg} t = \frac{\cos t}{\sin t}$$

$$\operatorname{cotg} t = \frac{1}{\operatorname{tg} t}$$

$$\sin^2 t + \cos^2 t = 1 \qquad \sin(-t) = -\sin t$$

$$1 + \operatorname{tg}^2 t = \sec^2 t \qquad \cos(-t) = \cos t$$

$$1 + \operatorname{cotg}^2 t = \operatorname{cosec}^2 t \qquad \operatorname{tg}(-t) = -\operatorname{tg} t$$

$$\sin(u+v) = \sin u \cos v + \cos u \sin v$$

$$\cos(u+v) = \cos u \cos v - \sin u \sin v$$

$$\operatorname{tg}(u+v) = \frac{\operatorname{tg} u + \operatorname{tg} v}{1 - \operatorname{tg} u \operatorname{tg} v}$$

$$\sin(u-v) = \sin u \cos v - \cos u \sin v$$

$$\cos(u-v) = \cos u \cos v + \sin u \sin v$$

$$\operatorname{tg}(u-v) = \frac{\operatorname{tg} u - \operatorname{tg} v}{1 + \operatorname{tg} u \operatorname{tg} v}$$

$$\sin 2u = 2 \sin u \cos u$$

$$\cos 2u = \cos^2 u - \sin^2 u = 1 - 2\sin^2 u = 2\cos^2 u - 1$$

$$\operatorname{tg} 2u = \frac{2 \operatorname{tg} u}{1 - \operatorname{tg}^2 u}$$

$$\left|\sin\frac{u}{2}\right| = \sqrt{\frac{1-\cos u}{2}} \qquad \left|\cos\frac{u}{2}\right| = \sqrt{\frac{1+\cos u}{2}}$$

$$\operatorname{tg}\frac{u}{2} = \frac{1-\cos u}{\sin u} = \frac{\sin u}{1+\cos u}$$

$$\sin^2 u = \frac{1-\cos 2u}{2} \qquad \cos^2 u = \frac{1+\cos 2u}{2}$$

$$\sin u \cos v = \tfrac{1}{2}\left[\sin(u+v) + \sin(u-v)\right]$$

$$\cos u \sin v = \tfrac{1}{2}\left[\sin(u+v) - \sin(u-v)\right]$$

$$\cos u \cos v = \tfrac{1}{2}\left[\cos(u+v) + \cos(u-v)\right]$$

$$\sin u \sin v = \tfrac{1}{2}\left[\cos(u-v) - \cos(u+v)\right]$$