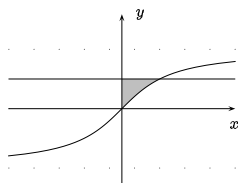


1. Consider the region bounded by
 $y = \arctan x$, $x = 0$, $y = \frac{\pi}{4}$.



Set up but *do not evaluate* the integrals to determine

- (a) the area of the bounded region,
(b) and the volume of revolution obtained by rotating the bounded region about
(i) the x -axis, (ii) the y -axis.

2. Evaluate each integral.

(a) $\int_1^4 \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$ (b) $\int \arctan x dx$
(c) $\int \sin^4 3x dx$ (d) $\int \tan^4 x \sec^4 x dx$
(e) $\int \frac{dx}{\sqrt{4x^2 + 9}}$ (f) $\int \frac{dx}{x(x+1)^2}$

3. Find the following limits.

(a) $\lim_{x \rightarrow 1^-} \frac{2}{x^{1-x}}$ (b) $\lim_{x \rightarrow \frac{\pi}{2}^-} \frac{\sec x}{\tan x}$

4. Find the solution of the differential equation that satisfies the given initial condition.

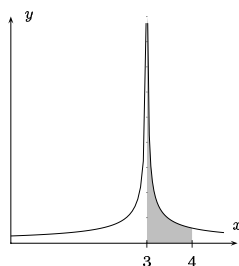
$$\frac{\sqrt{x^2 + 9}}{y^2} \frac{dy}{dx} = x, \quad y(0) = -1$$

5. Evaluate the following improper integrals.

- (a) Consider the graph of

$$f(x) = \frac{1}{(x-3)^{2/3}}$$

Is it possible to assign a finite number to the area between $f(x)$ and the x -axis to the right of $x = 3$ and bounded by $x = 4$? If it is possible find the number.



(b) $\int_{-\infty}^0 \frac{dx}{x^2 + 1}$.

6. Determine whether the *sequence* is convergent or divergent. If it is convergent, determine its limit.

(a) $a_n = \frac{2 + n^3}{3 + 2n^3}$ (b) $a_n = \cos n$

7. Find the sum of the series

$$\sum_{n=1}^{\infty} \frac{4}{(2n-1)(2n+1)}$$

8. Determine whether the following series converge or diverge. State the test used and show that the conditions for the application of the test have been met.

(a) $\sum_{n=2}^{\infty} \frac{1}{n\sqrt{\ln n}}$ (b) $\sum_{n=1}^{\infty} \frac{2n+1}{3n+2}$
(c) $\sum_{n=2}^{\infty} \frac{1}{(\ln n)^n}$ (d) $\sum_{n=1}^{\infty} \frac{\sqrt{n+1}}{n^{3/2} + 1}$

9. Which does each of the following alternating series do: converge absolutely, converge conditionally, or diverge? Why?

(a) $\sum_{n=1}^{\infty} (-1)^{n+1} \frac{n3^{n+1}}{4^n}$ (b) $\sum_{n=1}^{\infty} \frac{(-1)^n}{3\sqrt{n} + 5}$

10. Find the radius of convergence and the interval of convergence of the following power series.

$$\sum_{n=2}^{\infty} \frac{3^n x^n}{n^2}$$

11. Find the first four nonzero terms of the Taylor series for

$$f(x) = \ln x$$

centered at $x = 1$.

1. (a) $\int_1^0 \frac{1}{x} dx = -\ln x \Big|_1^0 = -\lim_{x \rightarrow 0^+} \ln x = \infty$ (b) $\int_1^0 \frac{1}{x^2} dx = -\frac{1}{x} \Big|_1^0 = \infty$ (c) $\int_1^0 \frac{1}{x^3} dx = -\frac{1}{2x^2} \Big|_1^0 = \infty$ (d) $\int_1^0 \frac{1}{x^4} dx = -\frac{1}{3x^3} \Big|_1^0 = \infty$ (e) $\int_1^0 \frac{1}{x^5} dx = -\frac{1}{4x^4} \Big|_1^0 = \infty$ (f) $\int_1^0 \frac{1}{x^6} dx = -\frac{1}{5x^5} \Big|_1^0 = \infty$ (g) $\int_1^0 \frac{1}{x^7} dx = -\frac{1}{6x^6} \Big|_1^0 = \infty$ (h) $\int_1^0 \frac{1}{x^8} dx = -\frac{1}{7x^7} \Big|_1^0 = \infty$ (i) $\int_1^0 \frac{1}{x^9} dx = -\frac{1}{8x^8} \Big|_1^0 = \infty$ (j) $\int_1^0 \frac{1}{x^{10}} dx = -\frac{1}{9x^9} \Big|_1^0 = \infty$ (k) $\int_1^0 \frac{1}{x^{11}} dx = -\frac{1}{10x^{10}} \Big|_1^0 = \infty$ (l) $\int_1^0 \frac{1}{x^{12}} dx = -\frac{1}{11x^{11}} \Big|_1^0 = \infty$ (m) $\int_1^0 \frac{1}{x^{13}} dx = -\frac{1}{12x^{12}} \Big|_1^0 = \infty$ (n) $\int_1^0 \frac{1}{x^{14}} dx = -\frac{1}{13x^{13}} \Big|_1^0 = \infty$ (o) $\int_1^0 \frac{1}{x^{15}} dx = -\frac{1}{14x^{14}} \Big|_1^0 = \infty$ (p) $\int_1^0 \frac{1}{x^{16}} dx = -\frac{1}{15x^{15}} \Big|_1^0 = \infty$ (q) $\int_1^0 \frac{1}{x^{17}} dx = -\frac{1}{16x^{16}} \Big|_1^0 = \infty$ (r) $\int_1^0 \frac{1}{x^{18}} dx = -\frac{1}{17x^{17}} \Big|_1^0 = \infty$ (s) $\int_1^0 \frac{1}{x^{19}} dx = -\frac{1}{18x^{18}} \Big|_1^0 = \infty$ (t) $\int_1^0 \frac{1}{x^{20}} dx = -\frac{1}{19x^{19}} \Big|_1^0 = \infty$ (u) $\int_1^0 \frac{1}{x^{21}} dx = -\frac{1}{20x^{20}} \Big|_1^0 = \infty$ (v) $\int_1^0 \frac{1}{x^{22}} dx = -\frac{1}{21x^{21}} \Big|_1^0 = \infty$ (w) $\int_1^0 \frac{1}{x^{23}} dx = -\frac{1}{22x^{22}} \Big|_1^0 = \infty$ (x) $\int_1^0 \frac{1}{x^{24}} dx = -\frac{1}{23x^{23}} \Big|_1^0 = \infty$ (y) $\int_1^0 \frac{1}{x^{25}} dx = -\frac{1}{24x^{24}} \Big|_1^0 = \infty$ (z) $\int_1^0 \frac{1}{x^{26}} dx = -\frac{1}{25x^{25}} \Big|_1^0 = \infty$ (aa) $\int_1^0 \frac{1}{x^{27}} dx = -\frac{1}{26x^{26}} \Big|_1^0 = \infty$ (ab) $\int_1^0 \frac{1}{x^{28}} dx = -\frac{1}{27x^{27}} \Big|_1^0 = \infty$ (ac) $\int_1^0 \frac{1}{x^{29}} dx = -\frac{1}{28x^{28}} \Big|_1^0 = \infty$ (ad) $\int_1^0 \frac{1}{x^{30}} dx = -\frac{1}{29x^{29}} \Big|_1^0 = \infty$ (ae) $\int_1^0 \frac{1}{x^{31}} dx = -\frac{1}{30x^{30}} \Big|_1^0 = \infty$ (af) $\int_1^0 \frac{1}{x^{32}} dx = -\frac{1}{31x^{31}} \Big|_1^0 = \infty$ (ag) $\int_1^0 \frac{1}{x^{33}} dx = -\frac{1}{32x^{32}} \Big|_1^0 = \infty$ (ah) $\int_1^0 \frac{1}{x^{34}} dx = -\frac{1}{33x^{33}} \Big|_1^0 = \infty$ (ai) $\int_1^0 \frac{1}{x^{35}} dx = -\frac{1}{34x^{34}} \Big|_1^0 = \infty$ (aj) $\int_1^0 \frac{1}{x^{36}} dx = -\frac{1}{35x^{35}} \Big|_1^0 = \infty$ (ak) $\int_1^0 \frac{1}{x^{37}} dx = -\frac{1}{36x^{36}} \Big|_1^0 = \infty$ (al) $\int_1^0 \frac{1}{x^{38}} dx = -\frac{1}{37x^{37}} \Big|_1^0 = \infty$ (am) $\int_1^0 \frac{1}{x^{39}} dx = -\frac{1}{38x^{38}} \Big|_1^0 = \infty$ (an) $\int_1^0 \frac{1}{x^{40}} dx = -\frac{1}{39x^{39}} \Big|_1^0 = \infty$ (ao) $\int_1^0 \frac{1}{x^{41}} dx = -\frac{1}{40x^{40}} \Big|_1^0 = \infty$ (ap) $\int_1^0 \frac{1}{x^{42}} dx = -\frac{1}{41x^{41}} \Big|_1^0 = \infty$ (aq) $\int_1^0 \frac{1}{x^{43}} dx = -\frac{1}{42x^{42}} \Big|_1^0 = \infty$ (ar) $\int_1^0 \frac{1}{x^{44}} dx = -\frac{1}{43x^{43}} \Big|_1^0 = \infty$ (as) $\int_1^0 \frac{1}{x^{45}} dx = -\frac{1}{44x^{44}} \Big|_1^0 = \infty$ (at) $\int_1^0 \frac{1}{x^{46}} dx = -\frac{1}{45x^{45}} \Big|_1^0 = \infty$ (au) $\int_1^0 \frac{1}{x^{47}} dx = -\frac{1}{46x^{46}} \Big|_1^0 = \infty$ (av) $\int_1^0 \frac{1}{x^{48}} dx = -\frac{1}{47x^{47}} \Big|_1^0 = \infty$ (aw) $\int_1^0 \frac{1}{x^{49}} dx = -\frac{1}{48x^{48}} \Big|_1^0 = \infty$ (ax) $\int_1^0 \frac{1}{x^{50}} dx = -\frac{1}{49x^{49}} \Big|_1^0 = \infty$ (ay) $\int_1^0 \frac{1}{x^{51}} dx = -\frac{1}{50x^{50}} \Big|_1^0 = \infty$ (az) $\int_1^0 \frac{1}{x^{52}} dx = -\frac{1}{51x^{51}} \Big|_1^0 = \infty$ (ba) $\int_1^0 \frac{1}{x^{53}} dx = -\frac{1}{52x^{52}} \Big|_1^0 = \infty$ (bb) $\int_1^0 \frac{1}{x^{54}} dx = -\frac{1}{53x^{53}} \Big|_1^0 = \infty$ (bc) $\int_1^0 \frac{1}{x^{55}} dx = -\frac{1}{54x^{54}} \Big|_1^0 = \infty$ (bd) $\int_1^0 \frac{1}{x^{56}} dx = -\frac{1}{55x^{55}} \Big|_1^0 = \infty$ (be) $\int_1^0 \frac{1}{x^{57}} dx = -\frac{1}{56x^{56}} \Big|_1^0 = \infty$ (bf) $\int_1^0 \frac{1}{x^{58}} dx = -\frac{1}{57x^{57}} \Big|_1^0 = \infty$ (bg) $\int_1^0 \frac{1}{x^{59}} dx = -\frac{1}{58x^{58}} \Big|_1^0 = \infty$ (bh) $\int_1^0 \frac{1}{x^{60}} dx = -\frac{1}{59x^{59}} \Big|_1^0 = \infty$ (bi) $\int_1^0 \frac{1}{x^{61}} dx = -\frac{1}{60x^{60}} \Big|_1^0 = \infty$ (bj) $\int_1^0 \frac{1}{x^{62}} dx = -\frac{1}{61x^{61}} \Big|_1^0 = \infty$ (bk) $\int_1^0 \frac{1}{x^{63}} dx = -\frac{1}{62x^{62}} \Big|_1^0 = \infty$ (bl) $\int_1^0 \frac{1}{x^{64}} dx = -\frac{1}{63x^{63}} \Big|_1^0 = \infty$ (bm) $\int_1^0 \frac{1}{x^{65}} dx = -\frac{1}{64x^{64}} \Big|_1^0 = \infty$ (bn) $\int_1^0 \frac{1}{x^{66}} dx = -\frac{1}{65x^{65}} \Big|_1^0 = \infty$ (bo) $\int_1^0 \frac{1}{x^{67}} dx = -\frac{1}{66x^{66}} \Big|_1^0 = \infty$ (bp) $\int_1^0 \frac{1}{x^{68}} dx = -\frac{1}{67x^{67}} \Big|_1^0 = \infty$ (bq) $\int_1^0 \frac{1}{x^{69}} dx = -\frac{1}{68x^{68}} \Big|_1^0 = \infty$ (br) $\int_1^0 \frac{1}{x^{70}} dx = -\frac{1}{69x^{69}} \Big|_1^0 = \infty$ (bs) $\int_1^0 \frac{1}{x^{71}} dx = -\frac{1}{70x^{70}} \Big|_1^0 = \infty$ (bt) $\int_1^0 \frac{1}{x^{72}} dx = -\frac{1}{71x^{71}} \Big|_1^0 = \infty$ (bu) $\int_1^0 \frac{1}{x^{73}} dx = -\frac{1}{72x^{72}} \Big|_1^0 = \infty$ (bv) $\int_1^0 \frac{1}{x^{74}} dx = -\frac{1}{73x^{73}} \Big|_1^0 = \infty$ (bw) $\int_1^0 \frac{1}{x^{75}} dx = -\frac{1}{74x^{74}} \Big|_1^0 = \infty$ (bx) $\int_1^0 \frac{1}{x^{76}} dx = -\frac{1}{75x^{75}} \Big|_1^0 = \infty$ (by) $\int_1^0 \frac{1}{x^{77}} dx = -\frac{1}{76x^{76}} \Big|_1^0 = \infty$ (bz) $\int_1^0 \frac{1}{x^{78}} dx = -\frac{1}{77x^{77}} \Big|_1^0 = \infty$ (ca) $\int_1^0 \frac{1}{x^{79}} dx = -\frac{1}{78x^{78}} \Big|_1^0 = \infty$ (cb) $\int_1^0 \frac{1}{x^{80}} dx = -\frac{1}{79x^{79}} \Big|_1^0 = \infty$ (cc) $\int_1^0 \frac{1}{x^{81}} dx = -\frac{1}{80x^{80}} \Big|_1^0 = \infty$ (cd) $\int_1^0 \frac{1}{x^{82}} dx = -\frac{1}{81x^{81}} \Big|_1^0 = \infty$ (ce) $\int_1^0 \frac{1}{x^{83}} dx = -\frac{1}{82x^{82}} \Big|_1^0 = \infty$ (cf) $\int_1^0 \frac{1}{x^{84}} dx = -\frac{1}{83x^{83}} \Big|_1^0 = \infty$ (cg) $\int_1^0 \frac{1}{x^{85}} dx = -\frac{1}{84x^{84}} \Big|_1^0 = \infty$ (ch) $\int_1^0 \frac{1}{x^{86}} dx = -\frac{1}{85x^{85}} \Big|_1^0 = \infty$ (ci) $\int_1^0 \frac{1}{x^{87}} dx = -\frac{1}{86x^{86}} \Big|_1^0 = \infty$ (cj) $\int_1^0 \frac{1}{x^{88}} dx = -\frac{1}{87x^{87}} \Big|_1^0 = \infty$ (ck) $\int_1^0 \frac{1}{x^{89}} dx = -\frac{1}{88x^{88}} \Big|_1^0 = \infty$ (cl) $\int_1^0 \frac{1}{x^{90}} dx = -\frac{1}{89x^{89}} \Big|_1^0 = \infty$ (cm) $\int_1^0 \frac{1}{x^{91}} dx = -\frac{1}{90x^{90}} \Big|_1^0 = \infty$ (cn) $\int_1^0 \frac{1}{x^{92}} dx = -\frac{1}{91x^{91}} \Big|_1^0 = \infty$ (co) $\int_1^0 \frac{1}{x^{93}} dx = -\frac{1}{92x^{92}} \Big|_1^0 = \infty$ (cp) $\int_1^0 \frac{1}{x^{94}} dx = -\frac{1}{93x^{93}} \Big|_1^0 = \infty$ (cq) $\int_1^0 \frac{1}{x^{95}} dx = -\frac{1}{94x^{94}} \Big|_1^0 = \infty$ (cr) $\int_1^0 \frac{1}{x^{96}} dx = -\frac{1}{95x^{95}} \Big|_1^0 = \infty$ (cs) $\int_1^0 \frac{1}{x^{97}} dx = -\frac{1}{96x^{96}} \Big|_1^0 = \infty$ (ct) $\int_1^0 \frac{1}{x^{98}} dx = -\frac{1}{97x^{97}} \Big|_1^0 = \infty$ (cu) $\int_1^0 \frac{1}{x^{99}} dx = -\frac{1}{98x^{98}} \Big|_1^0 = \infty$ (cv) $\int_1^0 \frac{1}{x^{100}} dx = -\frac{1}{99x^{99}} \Big|_1^0 = \infty$ (cw) $\int_1^0 \frac{1}{x^{101}} dx = -\frac{1}{100x^{100}} \Big|_1^0 = \infty$ (cx) $\int_1^0 \frac{1}{x^{102}} dx = -\frac{1}{101x^{101}} \Big|_1^0 = \infty$ (cy) $\int_1^0 \frac{1}{x^{103}} dx = -\frac{1}{102x^{102}} \Big|_1^0 = \infty$ (cz) $\int_1^0 \frac{1}{x^{104}} dx = -\frac{1}{103x^{103}} \Big|_1^0 = \infty$ (ca) $\int_1^0 \frac{1}{x^{105}} dx = -\frac{1}{104x^{104}} \Big|_1^0 = \infty$ (cb) $\int_1^0 \frac{1}{x^{106}} dx = -\frac{1}{105x^{105}} \Big|_1^0 = \infty$ (cc) $\int_1^0 \frac{1}{x^{107}} dx = -\frac{1}{106x^{106}} \Big|_1^0 = \infty$ (cd) $\int_1^0 \frac{1}{x^{108}} dx = -\frac{1}{107x^{107}} \Big|_1^0 = \infty$ (ce) $\int_1^0 \frac{1}{x^{109}} dx = -\frac{1}{108x^{108}} \Big|_1^0 = \infty$ (cf) $\int_1^0 \frac{1}{x^{110}} dx = -\frac{1}{109x^{109}} \Big|_1^0 = \infty$ (cg) $\int_1^0 \frac{1}{x^{111}} dx = -\frac{1}{110x^{110}} \Big|_1^0 = \infty$ (ch) $\int_1^0 \frac{1}{x^{112}} dx = -\frac{1}{111x^{111}} \Big|_1^0 = \infty$ (ci) $\int_1^0 \frac{1}{x^{113}} dx = -\frac{1}{112x^{112}} \Big|_1^0 = \infty$ (cj) $\int_1^0 \frac{1}{x^{114}} dx = -\frac{1}{113x^{113}} \Big|_1^0 = \infty$ (ck) $\int_1^0 \frac{1}{x^{115}} dx = -\frac{1}{114x^{114}} \Big|_1^0 = \infty$ (cl) $\int_1^0 \frac{1}{x^{116}} dx = -\frac{1}{115x^{115}} \Big|_1^0 = \infty$ (cm) $\int_1^0 \frac{1}{x^{117}} dx = -\frac{1}{116x^{116}} \Big|_1^0 = \infty$ (cn) $\int_1^0 \frac{1}{x^{118}} dx = -\frac{1}{117x^{117}} \Big|_1^0 = \infty$ (co) $\int_1^0 \frac{1}{x^{119}} dx = -\frac{1}{118x^{118}} \Big|_1^0 = \infty$ (cp) $\int_1^0 \frac{1}{x^{120}} dx = -\frac{1}{119x^{119}} \Big|_1^0 = \infty$ (cq) $\int_1^0 \frac{1}{x^{121}} dx = -\frac{1}{120x^{120}} \Big|_1^0 = \infty$ (cr) $\int_1^0 \frac{1}{x^{122}} dx = -\frac{1}{121x^{121}} \Big|_1^0 = \infty$ (cs) $\int_1^0 \frac{1}{x^{123}} dx = -\frac{1}{122x^{122}} \Big|_1^0 = \infty$ (ct) $\int_1^0 \frac{1}{x^{124}} dx = -\frac{1}{123x^{123}} \Big|_1^0 = \infty$ (cu) $\int_1^0 \frac{1}{x^{125}} dx = -\frac{1}{124x^{124}} \Big|_1^0 = \infty$ (cv) $\int_1^0 \frac{1}{x^{126}} dx = -\frac{1}{125x^{125}} \Big|_1^0 = \infty$ (cw) $\int_1^0 \frac{1}{x^{127}} dx = -\frac{1}{126x^{126}} \Big|_1^0 = \infty$ (cx) $\int_1^0 \frac{1}{x^{128}} dx = -\frac{1}{127x^{127}} \Big|_1^0 = \infty$ (cy) $\int_1^0 \frac{1}{x^{129}} dx = -\frac{1}{128x^{128}} \Big|_1^0 = \infty$ (cz) $\int_1^0 \frac{1}{x^{130}} dx = -\frac{1}{129x^{129}} \Big|_1^0 = \infty$ (ca) $\int_1^0 \frac{1}{x^{131}} dx = -\frac{1}{130x^{130}} \Big|_1^0 = \infty$ (cb) $\int_1^0 \frac{1}{x^{132}} dx = -\frac{1}{131x^{131}} \Big|_1^0 = \infty$ (cc) $\int_1^0 \frac{1}{x^{133}} dx = -\frac{1}{132x^{132}} \Big|_1^0 = \infty$ (cd) $\int_1^0 \frac{1}{x^{134}} dx = -\frac{1}{133x^{133}} \Big|_1^0 = \infty$ (ce) $\int_1^0 \frac{1}{x^{135}} dx = -\frac{1}{134x^{134}} \Big|_1^0 = \infty$ (cf) $\int_1^0 \frac{1}{x^{136}} dx = -\frac{1}{135x^{135}} \Big|_1^0 = \infty$ (cg) $\int_1^0 \frac{1}{x^{137}} dx = -\frac{1}{136x^{136}} \Big|_1^0 = \infty$ (ch) $\int_1^0 \frac{1}{x^{138}} dx = -\frac{1}{137x^{137}} \Big|_1^0 = \infty$ (ci) $\int_1^0 \frac{1}{x^{139}} dx = -\frac{1}{138x^{138}} \Big|_1^0 = \infty$ (cj) $\int_1^0 \frac{1}{x^{140}} dx = -\frac{1}{139x^{139}} \Big|_1^0 = \infty$ (ck) $\int_1^0 \frac{1}{x^{141}} dx = -\frac{1}{140x^{140}} \Big|_1^0 = \infty$ (cl) $\int_1^0 \frac{1}{x^{142}} dx = -\frac{1}{141x^{141}} \Big|_1^0 = \infty$ (cm) $\int_1^0 \frac{1}{x^{143}} dx = -\frac{1}{142x^{142}} \Big|_1^0 = \infty$ (cn) $\int_1^0 \frac{1}{x^{144}} dx = -\frac{1}{143x^{143}} \Big|_1^0 = \infty$ (co) $\int_1^0 \frac{1}{x^{145}} dx = -\frac{1}{144x^{144}} \Big|_1^0 = \infty$ (cp) $\int_1^0 \frac{1}{x^{146}} dx = -\frac{1}{145x^{145}} \Big|_1^0 = \infty$ (cq) $\int_1^0 \frac{1}{x^{147}} dx = -\frac{1}{146x^{146}} \Big|_1^0 = \infty$ (cr) $\int_1^0 \frac{1}{x^{148}} dx = -\frac{1}{147x^{147}} \Big|_1^0 = \infty$ (cs) $\int_1^0 \frac{1}{x^{149}} dx = -\frac{1}{148x^{148}} \Big|_1^0 = \infty$ (ct) $\int_1^0 \frac{1}{x^{150}} dx = -\frac{1}{149x^{149}} \Big|_1^0 = \infty$ (cu) $\int_1^0 \frac{1}{x^{151}} dx = -\frac{1}{150x^{150}} \Big|_1^0 = \infty$ (cv) $\int_1^0 \frac{1}{x^{152}} dx = -\frac{1}{151x^{151}} \Big|_1^0 = \infty$ (cw) $\int_1^0 \frac{1}{x^{153}} dx = -\frac{1}{152x^{152}} \Big|_1^0 = \infty$ (cx) $\int_1^0 \frac{1}{x^{154}} dx = -\frac{1}{153x^{153}} \Big|_1^0 = \infty$ (cy) $\int_1^0 \frac{1}{x^{155}} dx = -\frac{1}{154x^{154}} \Big|_1^0 = \infty$ (cz) $\int_1^0 \frac{1}{x^{156}} dx = -\frac{1}{155x^{155}} \Big|_1^0 = \infty$ (ca) $\int_1^0 \frac{1}{x^{157}} dx = -\frac{1}{156x^{156}} \Big|_1^0 = \infty$ (cb) $\int_1^0 \frac{1}{x^{158}} dx = -\frac{1}{157x^{157}} \Big|_1^0 = \infty$ (cc) $\int_1^0 \frac{1}{x^{159}} dx = -\frac{1}{158x^{158}} \Big|_1^0 = \infty$ (cd) $\int_1^0 \frac{1}{x^{160}} dx = -\frac{1}{159x^{159}} \Big|_1^0 = \infty$ (ce) $\int_1^0 \frac{1}{x^{161}} dx = -\frac{1}{160x^{160}} \Big|_1^0 = \infty$ (cf) $\int_1^0 \frac{1}{x^{162}} dx = -\frac{1}{161x^{161}} \Big|_1^0 = \infty$ (cg) $\int_1^0 \frac{1}{x^{163}} dx = -\frac{1}{162x^{162}} \Big|_1^0 = \infty$ (ch) $\int_1^0 \frac{1}{x^{164}} dx = -\frac{1}{163x^{163}} \Big|_1^0 = \infty$ (ci) $\int_1^0 \frac{1}{x^{165}} dx = -\frac{1}{164x^{164}} \Big|_1^0 = \infty$ (cj) $\int_1^0 \frac{1}{x^{166}} dx = -\frac{1}{165x^{165}} \Big|_1^0 = \infty$ (ck) $\int_1^0 \frac{1}{x^{167}} dx = -\frac{1}{166x^{166}} \Big|_1^0 = \infty$ (cl) $\int_1^0 \frac{1}{x^{168}} dx = -\frac{1}{167x^{167}} \Big|_1^0 = \infty$ (cm) $\int_1^0 \frac{1}{x^{169}} dx = -\frac{1}{168x^{168}} \Big|_1^0 = \infty$ (cn) $\int_1^0 \frac{1}{x^{170}} dx = -\frac{1}{169x^{169}} \Big|_1^0 = \infty$ (co) $\int_1^0 \frac{1}{x^{171}} dx = -\frac{1}{170x^{170}} \Big|_1^0 = \infty$ (cp) $\int_1^0 \frac{1}{x^{172}} dx = -\frac{1}{171x^{171}} \Big|_1^0 = \infty$ (cq) $\int_1^0 \frac{1}{x^{173}} dx = -\frac{1}{172x^{172}} \Big|_1^0 = \infty$ (cr) $\int_1^0 \frac{1}{x^{174}} dx = -\frac{1}{173x^{173}} \Big|_1^0 = \infty$ (cs) $\int_1^0 \frac{1}{x^{175}} dx = -\frac{1}{174x^{174}} \Big|_1^0 = \infty$ (ct) $\int_1^0 \frac{1}{x^{176}} dx = -\frac{1}{175x^{175}} \Big|_1^0 = \infty$ (cu) $\int_1^0 \frac{1}{x^{177}} dx = -\frac{1}{176x^{176}} \Big|_1^0 = \infty$ (cv) $\int_1^0 \frac{1}{x^{178}} dx = -\frac{1}{177x^{177}} \Big|_1^0 = \infty$ (cw) $\int_1^0 \frac{1}{x^{179}} dx = -\frac{1}{178x^{178}} \Big|_1^0 = \infty$ (cx) $\int_1^0 \frac{1}{x^{180}} dx = -\frac{1}{179x^{179}} \Big|_1^0 = \infty$ (cy) $\int_1^0 \frac{1}{x^{181}} dx = -\frac{1}{180x^{180}} \Big|_1^0 = \infty$ (cz) $\int_1^0 \frac{1}{x^{182}} dx = -\frac{1}{181x^{181}} \Big|_1^0 = \infty$ (ca) $\int_1^0 \frac{1}{x^{183}} dx = -\frac{1}{182x^{182}} \Big|_1^0 = \infty$ (cb) $\int_1^0 \frac{1}{x^{184}} dx = -\frac{1}{183x^{183}} \Big|_1^0 = \infty$ (cc) $\int_1^0 \frac{1}{x^{185}} dx = -\frac{1}{184x^{184}} \Big|_1^0 = \infty$ (cd) $\int_1^0 \frac{1}{x^{186}} dx = -\frac{1}{185x^{185}} \Big|_1^0 = \infty$ (ce) $\int_1^0 \frac{1}{x^{187}} dx = -\frac{1}{186x^{186}} \Big|_1^0 = \infty$ (cf) $\int_1^0 \frac{1}{x^{188}} dx = -\frac{1}{187x^{187}} \Big|_1^0 = \infty$ (cg) $\int_1^0 \frac{1}{x^{189}} dx = -\frac{1}{188x^{188}} \Big|_1^0 = \infty$ (ch) $\int_1^0 \frac{1}{x^{190}} dx = -\frac{1}{189x^{189}} \Big|_1^0 = \infty$ (ci) $\int_1^0 \frac{1}{x^{191}} dx = -\frac{1}{190x^{190}} \Big|_1^0 = \infty$ (cj) $\int_1^0 \frac{1}{x^{192}} dx = -\frac{1}{191x^{191}} \Big|_1^0 = \infty$ (ck) $\int_1^0 \frac{1}{x^{193}} dx = -\frac{1}{192x^{192}} \Big|_1^0 = \infty$ (cl) $\int_1^0 \frac{1}{x^{194}} dx = -\frac{1}{193x^{193}} \Big|_1^0 = \infty$ (cm) $\int_1^0 \frac{1}{x^{195}} dx = -\frac{1}{194x^{194}} \Big|_1^0 = \infty$ (cn) $\int_1^0 \frac{1}{x^{196}} dx = -\frac{1}{195x^{195$