

Exercice 5 page 183

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|---|---|
| {1} $\frac{1}{5}x^5 + C$ | {21} $2 \ln x + \frac{2}{3}x\sqrt{x} + C$ |
| {2} $\frac{3}{4}t^8 + C$ | {22} $\frac{1}{3}t^3 - \frac{3}{2}t^2$ |
| {3} $4u + C$ | {23} $\frac{2}{3}x^3 - 3 \ln x + C$ |
| {4} $\frac{1}{4}z^4 - 3z + C$ | {24} $1 - \arctan x + C$ |
| {5} $\frac{-1}{x} + C$ | {25} $\frac{1}{3}x^3 - 6\sqrt{x} + C$ |
| {6} $\frac{2}{3}x\sqrt{x} + C$ | {26} $-\cos x + \sin x + C$ |
| {7} $\frac{1}{5}x^5 + x^3 + C$ | {27} $x^2 - \sin x + C$ |
| {8} $\frac{-1}{5x} + C$ | {28} $2x\sqrt{x} - 3 \cos x + C$ |
| {9} $\frac{3}{4}t^4 - 3t + C$ | {29} $\frac{1}{2}x^2 - \frac{1}{x} - 6\sqrt{x} + C$ |
| {10} $\frac{1}{10}x^5 - \frac{1}{6}x^4 - \frac{1}{4}x^2 + \frac{1}{3}x + C$ | {30} $-\cos 2x + C$ |
| {11} $\frac{4}{3}t - \frac{1}{3}t^2 + \frac{5}{12}t^4 + C$ | {31} $\sin x + C$ |
| {12} $\frac{-1}{x} - \frac{1}{4}x^2 + x + C$ | {32} $e^x + 2x + C$ |
| {13} $2\sqrt{t} + t^2 + C$ | {33} $-e^{-x} - \frac{1}{2}x^2 + C$ |
| {14} $\frac{1}{3}x^3 + \frac{1}{x^2} + C$ | {34} $\ln x - 4x + 3x^2 - \frac{4}{3}x^3 + \frac{1}{4}x^4 + C$ |
| {15} $\frac{2}{5}x^2\sqrt{x} + C$ | {35} $\frac{15}{2}\sqrt[3]{x^2} + \frac{2}{x} + \frac{2}{5}x^2\sqrt{x} + C$ |
| {16} $\frac{-4}{\sqrt{x}} + C$ | {36} $\frac{2}{5}x^2\sqrt{x}$ |
| {17} $x - 2\sqrt{x} + C$ | {37} $\frac{6}{5}u^2\sqrt{u} - \frac{10}{3}u\sqrt{u} + C$ |
| {18} $\frac{1}{3}z^3 + z^2 + z + C$ | {38} $\frac{1}{5}y^5 + 2y - \frac{1}{3y^3} + C$ |
| {19} $\frac{8}{5}x^5 + 3x^4 + 2x^3 + \frac{1}{2}x^2 + C$ | {39} $x - \sin^2 x + C$ |
| {20} $\frac{2}{3}x^3 - \frac{5}{2}x^2 - 3x + C$ | {40} $x + \tan x + C$ |

Exercice 6 page 184

$$\{1\} \frac{-1}{3} \cos 3x + C \quad t = 3x$$

$$\{16\} \frac{1}{5}(2x-1)^5 - \frac{5}{6}(2x-1)^3 + C \quad t = 2x-1$$

$$\{2\} 2 \sin \frac{x}{2} + C \quad t = \frac{x}{2}$$

$$\{17\} \frac{1}{2} \sin^2 x + C \quad t = \sin x$$

$$\{3\} \frac{-3}{2} \cos(2x+5) + C \quad t = 2x+5$$

$$\{18\} \frac{-1}{2} \sqrt{3-4z} + C \quad t = 3-4z$$

$$\{4\} \sqrt{2x} + C \quad t = 2x$$

$$\{19\} \frac{-8}{15\sqrt{5x-2}} + C \quad t = 5x-2$$

$$\{5\} \frac{-1}{3(3x+2)} + C \quad t = 3x+2$$

$$\{20\} \frac{1}{3} \ln |3x^3 + 3x - 5| + C \quad t = 3x^3 + 3x - 5$$

$$\{6\} \frac{1}{10}(2z+3)^5 + C \quad t = 2z+3$$

$$\{21\} \frac{2}{15}(3x-2)\sqrt{3x-2} + C \quad t = 3x-2$$

$$\{7\} \ln |\sin x| + C \quad t = \sin x$$

$$\{22\} \frac{1}{\cos x} + C \quad t = \cos x$$

$$\{8\} 3\sqrt{2x-6} + C \quad t = 2x-6$$

$$\{23\} \frac{\sqrt{2}}{8}(x\sqrt{2} + \sqrt{3})^4 + C \quad t = x\sqrt{2} + \sqrt{3}$$

$$\{9\} \frac{1}{5}(5x-2)^4 + C \quad t = 5x-2$$

$$\{24\} \frac{-1}{2} \cos(4x-1) + C \quad t = 4x-1$$

$$\{10\} 2 \ln |x| + \frac{3}{x} + \ln |x+2| + C$$

$$\{25\} \frac{-1}{4} \cos^4 x + C \quad t = \cos x$$

$$\{11\} \frac{-1}{3(3u+2)^2} + C \quad t = 3u+2$$

$$\{26\} -\sin(2-x\sqrt{3}) + C \quad t = 2-x\sqrt{3}$$

$$\{12\} \frac{-1}{3} \ln |\cos 3x| + C \quad t = \cos 3x$$

$$\{27\} \frac{1}{3} e^{3x-1} + C \quad t = 3x-1$$

$$\{13\} \ln |x + e^x| + C \quad t = x + e^x$$

$$\{28\} -e^{3-x} + C \quad t = 3-x$$

$$\{14\} \frac{-1}{3} \sqrt{(1-2t)^3} + C \quad u = 1-2t$$

$$\{29\} \ln |x-2| + 2 \ln |3-x| + C$$

$$\{15\} \ln |\ln(x)| + C \quad t = \ln x$$

$$\{30\} \odot \arctan(t+2) + C \quad u = t+2$$

Exercice 7 page 185

- {1} $\frac{1}{30}(x-1)^5(x+1) + C$ $f = x \quad g' = (x-1)^4$
 - {2} $\frac{1}{28}(z+1)^7(7z-11) + C$ $f = 2z-3 \quad g' = (z+1)^6$
 - {3} $\frac{1}{3}x \sin 3x + \frac{1}{9} \cos 3x + C$ $f = x \quad g' = \cos 3x$
 - {4} $\frac{1}{3}x^3(\ln x - \frac{1}{3}) + C$ $f = \ln x \quad g' = x^2$
 - {5} $\ominus \frac{-1}{4}x \cos 2x + \frac{1}{8} \sin 2x + C$ $\sin x \cos x = \frac{1}{2} \sin 2x$ puis $f = x \quad g' = \sin 2x$
 - {6} $\ominus \frac{1}{4}x^2 - \frac{1}{4}x \sin 2x - \frac{1}{8} \cos 2x + C$ utiliser $\sin^2 x = \frac{1 - \cos 2x}{2}$
 - {7} $\ominus \arctan x(\frac{1}{2}x^2 - 1) - \frac{1}{2}x + C$ $f = x \quad g' = \arctan x$
 - {8} $\frac{-1}{x}(\ln x + 1) + C$ $f = \ln x \quad g' = x^{-2}$
 - {9} voir exercices supplémentaires (série 5)
 - {10} idem que 4
 - {11} voir exercices supplémentaires (série 5)
 - {12} $\frac{2}{13}e^{3x}(\sin 2x + \frac{3}{2} \cos 2x) + C$ 2 fois
 - {13} $\frac{18}{37}e^{3x}(\sin 2x + \frac{1}{6} \cos 2x) + C$ 2 fois
 - {14} $\frac{1}{3}(2 \cos x \sin 2x - \sin x \cos 2x) + C$ $f = \cos x \quad g' = \cos 2x$ 2 fois
 - {15} $x \ln |x| - x + C$ $f = \ln x \quad g' = 1$
 - {16} $\ominus \frac{1}{2}x(\sin(\ln(x)) - \cos(\ln(x))) + C$ $f = \sin(\ln x) \quad g' = 1$
 - {17} $\ominus x \arctan x - \frac{1}{2} \ln |1 + x^2| + C$ $f = \arctan x \quad g' = 1$
 - {18} $x(\ln^2 x - 2 \ln x + 2) + C$ $f = \ln x \quad g' = \ln x$
 - {19} $\ominus x \ln(x^2 + 1) - 2 \arctan x + C$ $f = \ln(x^2 + 1) \quad g' = 1$
 - {20} $\frac{-2x\sqrt{x+1}}{x+1} + 4\sqrt{x+1} + C$ $f = x \quad g' = \sqrt{x+1}$
 - {21} voir exercices supplémentaires (série 5)
 - {22} $e^{3x}(\frac{1}{3}x^3 - \frac{1}{3}x^2 + \frac{2}{9}x + \frac{2}{27}) + C$ $f = x^3 \quad g' = e^{3x}$ (3 fois)
 - {23} $\frac{1}{4}x^4(\ln 4x - \frac{1}{4}) + C$ $f = \ln 4x \quad g' = x^3$
 - {24} $\ominus \frac{1}{4}(x^2 + \sin 2x) + C$ $\sin^2 x = 1 - \cos^2 x$ puis $f = \cos x \quad g' = \cos x$
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Exercice 9 page 186

$$\{1\} F(x) = \frac{2}{3}x^3 - 3x^2 + x + C$$

$$F(3) = -6 + C \quad \rightarrow \boxed{C = 2}$$

$$\{2\} F(x) = 2\sqrt{x} + \frac{1}{x} + C$$

$$F(1) = 3 + C \quad \rightarrow \boxed{C = -3}$$

$$\{3\} F(x) = \frac{1}{3}(x^2 - 3x - 6)^3 + C$$

$$F(-1) = \frac{-8}{3} + C \quad \rightarrow \boxed{C = \frac{35}{3}}$$

$$\{4\} F(x) = \frac{-1}{3} \cos\left(3x + \frac{\pi}{2}\right) + C$$

$$F\left(\frac{\pi}{6}\right) = \frac{1}{3} + C \quad \rightarrow \boxed{C = \frac{-1}{6}}$$

$$\{5\} F(x) = \frac{1}{2} \sin 2x + \frac{1}{3} \cos\left(3x - \frac{\pi}{4}\right) + C$$

$$F(0) = \frac{\sqrt{2}}{6} \quad \rightarrow \boxed{C = \frac{-\sqrt{2}}{6}}$$

$$\{6\} F(x) = \frac{-3}{2(x^2 + 1)} + C$$

$$F(\sqrt{2}) = \frac{-1}{2} + C \quad \rightarrow \boxed{C = \frac{-3}{2}}$$

$$\{7\} F(x) = \frac{1}{2}x^2 + 4\sqrt{x} + \frac{1}{x} + C$$

$$F(1) = \frac{11}{2} + C \quad \rightarrow \boxed{C = \frac{-7}{2}}$$