Corrigé
Composition de fonctions
Dérivée et primitive

Exercice 1. Dérivées

1. $f_1'(x) = 3\cos^2(x) \times (-\sin x) = -3\cos^2(x)\sin x$

2. $f_2'(x) = -\sin(x^3) \times 3x^2 = -3x^2\sin(x^3)$

3. $f_3'(x) = \frac{3x^2}{1+x^3}$

4. $f_4'(x) = \cos(e^x) \times e^x$

5. $f_5'(x) = e^{\sin x} \times \cos x$

6. $f_6'(x) = \frac{1}{\sqrt{x}} \times \frac{1}{2\sqrt{x}} = \frac{1}{2x}$

7. $f_7'(x) = \frac{1}{2\sqrt{\ln x}} \times \frac{1}{x} = \frac{1}{2x\sqrt{\ln x}}$

8. $f_8'(x) = -\sin(1+x^2) \times 2x = -2x\sin(1+x^2)$

9. $f_9'(x) = 3(x^2+1)^2 \times 2x = 6x(x^2+1)^2$

10. $f_{10}'(x) = \frac{-\sin x}{\cos x} = -\tan x$

11. $f_{11}'(x) = -\sin(\ln x) \times \frac{1}{x} = -\frac{\sin(\ln x)}{x}$

12. $f_{12}'(x) = \frac{\cos x}{1+\sin x}$

13. $f_{13}'(x) = 7\cos(7x-3)$

14. $f_{14}'(x) = e^{1+x^2} \times 2x = 2xe^{1+x^2}$

15. $f_{15}'(x) = \frac{1}{2\sqrt{e^x}} \times e^x = \frac{e^x}{2\sqrt{e^x}} = \frac{\sqrt{e^x}}{2}$

16. $f'_{16}(x) = 4(1+\ln x)^3 \times \frac{1}{x} = \frac{4(1+\ln x)^3}{x}$

17. $f'_{17}(x) = e^{5x^2+2x+1} \times (10x+2) = (10x+2)e^{5x^2+2x+1}$

Exercice 2. Primitives

1. $G_1(x) = e^{5x+3}$

2. $G_2(x) = e^{12x-7}$

3. $G_3(x) = 2e^{6x+10}$

4. $G_4(x) = -\frac{5}{2}e^{-2x}$

5. $G_5(x) = -\cos(7x)$

6. $G_6(x) = \sin(9x-2)$

7. $G_7(x) = -\frac{1}{5}\cos(5x+7)$

8. $G_8(x) = \frac{1}{10}\sin(10x-55)$

9. $G_9(x) = -\frac{2}{7}\cos(7x-3)$

10. $G_{10}(x) = -\frac{5}{2}\sin(-2x)$

11. $G_{11}(x) = (x+5)^3$

12. $G_{12}(x) = (5x+1)^4$

13. $G_{13}(x) = \frac{(10x-1)^3}{30}$

14. $G_{14}(x) = \frac{(x^2+10)^4}{8}$