

Déterminez une fonction F qui soit une primitive de la fonction f .

Les solutions sont au dos de la feuille, mais sans justifications.

1) $f(x) = \frac{x^3 - 3}{x^2}$	2) $f(x) = 2x + 1 - \frac{1}{x^2}$
3) $f(x) = (3x + 2)^6$	4) $f(x) = \sin(x) \cdot \cos^4(x)$
5) $f(x) = \frac{2x + 1}{(x^2 + x + 3)^2}$	6) $f(x) = \frac{x - 1}{x^2 - 2x + 4}$
7) $f(x) = \frac{2x - 1}{x^2 - x - 2}$	8) $f(x) = \sin(x) \cdot (1 - \cos(x))$
9) $f(x) = \frac{\cos(x)}{(4 \cdot \sin(x) - 1)^3}$	10) $f(x) = 1 + \tan^2(2x)$
11) $f(x) = (2x + 1)^3$	12) $f(x) = \frac{x}{x^2 - 4}$
13) $f(x) = \frac{1}{x \cdot \ln(x)}$	14) $f(x) = \frac{4x + 2}{x^2 + x + 1}$
15) $f(x) = \frac{2}{x^3} + \frac{1}{2x^2}$	16) $f(x) = \frac{1}{x} \cdot \ln(x)$
17) $f(x) = \frac{e^{\sqrt{2x}}}{\sqrt{2x}}$	18) $f(x) = \cos(x) \cdot \sqrt{\sin(x)}$
19) $f(x) = \frac{e^{1/x}}{x^2}$	20) $f(x) = \frac{1}{\sqrt[3]{x}}$
21) $f(x) = \frac{(x+1)^2}{x}$	22) $f(x) = x^2 \cdot e^{x^3}$
23) $f(x) = \sqrt[3]{x} + \frac{1}{\sqrt[3]{x}}$	24) $f(x) = 2 \cdot \sqrt{x} + \sqrt{2x}$
25) $f(x) = x \cdot \sqrt[3]{ax^2 + b}$, $a \neq 0$	26) $f(x) = \frac{2x + 1}{\sqrt{x^2 + x + 1}}$
27) $f(x) = \frac{3x^2}{\sqrt{9 + x^3}}$	28) $f(x) = \frac{3x^2}{\sqrt{5x^3 + 8}}$
29) $f(x) = (3x^2 + 1) \cdot \sqrt{x^3 + x + 2}$	30) $f(x) = (x + 2 \cdot \sqrt{x})^2$

Solutions :

1. $F(x) = \frac{x^2}{2} - 3 \cdot \frac{x^{-1}}{-1} + C = \frac{x^2}{2} + \frac{3}{x} + C$	2. $F(x) = x^2 + x - \frac{x^{-1}}{-1} + C = x^2 + x + \frac{1}{x} + C$
3. $F(x) = \frac{1}{21} \cdot (3x+2)^7 + C$	4. $F(x) = -\frac{1}{5} \cdot \cos^5(x) + C$
5. $F(x) = \frac{(x^2+x+3)^{-1}}{-1} + C = -\frac{1}{x^2+x+3} + C$	6. $F(x) = \ln(x^2-2x+4)/2 + C$
7. $F(x) = \ln(x^2-x-2) + C$	8. $F(x) = (1-\cos(x))^2/2 + C$
9. $F(x) = \frac{-1}{8 \cdot (4 \cdot \sin(x)-1)^2} + C$	10. $F(x) = \tan(2x)/2 + C$ c.f. ex. 18 série 5
11. $F(x) = \frac{1}{8} \cdot (2x+1)^4 + C$	12. $F(x) = \ln(x^2-4)/2 + C$
13. $F(x) = \ln(\ln(x)) + C$	14. $F(x) = 2 \cdot \ln(x^2+x+1) + C$
15. $F(x) = 2 \cdot \frac{x^{-2}}{-2} + \frac{1}{2} \cdot \frac{x^{-1}}{-1} + C = -\frac{1}{x^2} - \frac{1}{2x} + C$	16. $F(x) = \ln^2(x)/2 + C$
17. $F(x) = \exp(\sqrt{2x}) + C = e^{\sqrt{2x}} + C$	18. $F(x) = \frac{2}{3} \cdot (\sin(x))^{\frac{3}{2}} + C = \frac{2}{3} \cdot \sqrt{(\sin(x))^3} + C$
19. $F(x) = -\exp(1/x) + C = -e^{1/x} + C$	20. $F(x) = x^{\frac{2}{3}}/(2/3) + C = (3/2) \cdot \sqrt[3]{x^2} + C$
21. $F(x) = \frac{x^2}{2} + 2x + \ln(x) + C$	22. $F(x) = (1/3) \cdot \exp(x^3) + C = (1/3) \cdot e^{x^3} + C$
23. $F(x) = \frac{3}{4} \cdot x^{\frac{4}{3}} + \frac{3}{2} \cdot x^{\frac{2}{3}} + C = \frac{3}{4} \cdot \sqrt[3]{x^4} + \frac{3}{2} \cdot \sqrt[3]{x^2} + C$	24. $F(x) = \frac{4}{3} x^{\frac{3}{2}} + \frac{2 \cdot \sqrt{2}}{3} \cdot x^{\frac{3}{2}} + C = \left(\frac{4}{3} + \frac{2 \cdot \sqrt{2}}{3}\right) \cdot \sqrt{x^3} + C$
25. $F(x) = \frac{1}{2a} \cdot \frac{3}{4} (ax^2+b)^{\frac{4}{3}} + C = \frac{3}{8a} \cdot \sqrt[3]{(ax^2+b)^4} + C$	26. $F(x) = 2 \cdot (x^2+x+1)^{\frac{1}{2}} + C = 2 \cdot \sqrt{x^2+x+1} + C$
27. $F(x) = 2 \cdot (9+x^3)^{\frac{1}{2}} + C = 2 \cdot \sqrt{9+x^3} + C$	28. $F(x) = (1/5) \cdot 2 \cdot (5x^3+8)^{\frac{1}{2}} + C = (2/5) \cdot \sqrt{5x^3+8} + C$
29. $F(x) = \frac{2}{3} \cdot \sqrt{(x^3+x+2)^3} = \frac{2}{3} \cdot (x^3+x+2) \cdot \sqrt{x^3+x+2} + C$	30. $F(x) = \frac{1}{3} x^3 + 4 \cdot \frac{2}{5} \cdot x^{\frac{5}{2}} + 2x^2 + C = \frac{1}{3} x^3 + \frac{8}{5} \sqrt{x^5} + 2x^2 + C$