

Sans calculatrice et en détaillant les calculs, simplifier les expressions suivantes :

$$D = \frac{3^{-2} \times 27}{(3^2) \times 3^{-1}} = \frac{3^{-2} \times 3^3}{3^6 \times 3^{-1}} = \frac{3^1}{3^5} = 3^{1-5} = 3^{-4} = \frac{1}{3^4} = \frac{1}{81}.$$

$$E = \frac{25^2 \times 3^4}{15^3} = \frac{(5^2)^2 \times 3^4}{(3 \times 5)^3} = \frac{5^4 \times 3^4}{3^3 \times 5^3} = 5^{4-3} \times 3^{4-3} = 5^1 \times 3^1 = 5 \times 3 = 15.$$

$$F = \frac{14^2 \times (-3)^3}{21^2 \times 4^3} = \frac{(7 \times 2)^2 \times (-3)^3}{(7 \times 3)^2 \times (2^2)^3} = \frac{7^2 \times 2^2 \times 3^3}{7^2 \times 3^2 \times 2^6} = -(7^0 \times 2^{-4} \times 3^1) = -\frac{3}{2^4} = -\frac{3}{16}.$$