

$$10^o y = x(x-1)^2 \quad \text{Rép. } y' = (x-1)(3x-1).$$

$$11^o y = (x+2)(x-3)(x+4) \quad \text{» } y' = 3x^2 + 6x - 10.$$

$$12^o y = (x-7)(3x^2-4x+2) \quad \text{» } y' = 9x^2 - 50x + 30.$$

$$13^o y = (2+x)^2(1-x)^3$$

$$\text{Rép. } y' = -(2+x)(4+5x)(1-x)^2.$$

$$14^o y = (x^2-1)^3(1-2x^3)^4$$

$$\text{Rép. } y' = 6x(x^2-1)^2(1-2x^3)^3(1+4x-6x^3).$$

$$15^o y = x^2(1+x)^3(2-x)^2$$

$$\text{Rép. } y' = x(2-x)(1+x)^2(4+6x-7x^2).$$

306. Calculer les dérivées des fonctions suivantes :

$$1^o y = \frac{1}{1-3x^2} \quad \text{Rép. } y' = \frac{6x}{(1-3x^2)^2}$$

$$2^o y = \frac{3-x}{x} \quad \text{» } y' = -\frac{3}{x^2}$$

$$3^o y = \frac{x+1}{2x-1} \quad \text{» } y' = \frac{-3}{(2x-1)^2}$$

$$4^o y = \frac{2x+1}{x+3} \quad \text{» } y' = \frac{5}{(x+3)^2}$$

$$5^o y = \frac{x}{x^2-1} \quad \text{» } y' = \frac{-(x^2+1)}{(x^2-1)^2}$$

$$6^o y = \frac{x^2+1}{x^3-1} \quad \text{» } y' = \frac{-(x^4+3x^2+2x)}{(x^3-1)^2}$$

$$7^o y = \frac{2x+1}{4x^2+3x-1} \quad \text{» } y' = \frac{-(8x^2+8x+5)}{(4x^2+3x-1)^2}$$

$$8^o y = \frac{x^2+9}{x^2+12x+11} \quad \text{» } y' = \frac{12x^2+4x-108}{(x^2+12x+11)^2}$$

$$9^o y = \frac{x^2-6x+8}{x^2-2x+1} \quad \text{» } y' = \frac{2(2x-5)}{(x-1)^3}$$

$$10^o y = \frac{x^3-3x+2}{x^2-x+2}$$

$$\text{Rép. } y' = \frac{(x-1)(x^3-x^2+8x+4)}{(x^2-x+2)^2}$$

$$11^o y = \frac{x^3+1}{x^3+3x-2}$$

$$\text{Rép. } y' = \frac{3(2x^3-3x^2-1)}{(x^3+3x-2)^2}$$

$$12^o y = \frac{(x-1)^2}{x^3+9x-9}$$

$$\text{Rép. } y' = \frac{(x-1)(-x^3+3x^2+9x-9)}{(x^3+9x-9)^2}$$

$$13^o y = \frac{(x+1)^3}{(x-1)^2}$$

$$\text{Rép. } y' = \frac{(x+1)^2(x-5)}{(x-1)^3}$$

$$14^o y = \frac{(2x-1)^3}{(x^2+3)^4}$$

$$\text{Rép. } y' = \frac{2(2x-1)^2(-5x^2+4x+9)}{(x^2+3)^5}$$

$$15^o y = \frac{(x^2+1)(x-2)^4}{(x+7)^3}$$

$$\text{Rép. } y' = \frac{(x-2)^3(3x^3+44x^2-27x+34)}{(x+7)^4}$$

307. Calculer les dérivées des fonctions suivantes :

$$1^o y = \sqrt{2-x} \quad \text{Rép. } y' = \frac{-1}{2\sqrt{2-x}}$$

$$2^o y = \sqrt{3x^2-5x+7} \quad \text{» } y' = \frac{6x-5}{2\sqrt{3x^2-5x+7}}$$

$$3^o y = \sqrt[3]{5x^2-4x+1} \quad \text{» } y' = \frac{2(5x-2)}{3\sqrt[3]{(5x^2-4x+1)^2}}$$

$$4^o y = \sqrt{1+x^2} + \sqrt{1-x^2}$$

$$\text{Rép. } y' = \frac{x(\sqrt{1-x^2} - \sqrt{1+x^2})}{\sqrt{1-x^4}}$$

$$5^o y = 3x - \sqrt[3]{x^2-9}$$

$$\text{Rép. } y' = \frac{9\sqrt[3]{(x^2-9)^2} - 2x}{3\sqrt[3]{(x^2-9)^2}}$$

$$6^o y = 2x-1 - \sqrt{x^2+x+1}$$

$$\text{Rép. } y' = \frac{4\sqrt{x^2+x+1} - (2x+1)}{2\sqrt{x^2+x+1}}$$

$$7^o y = x\sqrt{2x^2+1} \quad \text{Rép. } y' = \frac{4x^2+1}{\sqrt{2x^2+1}}$$

$$8^o y = (2x-3)\sqrt{1-x^2} \quad \text{» } y' = \frac{-4x^2+3x+2}{\sqrt{1-x^2}}$$

$$9^{\circ} y = (x^2 + x + 1) \sqrt{1 - x^2} \quad \text{Rép. } y' = \frac{-3x^3 - 2x^2 + x + 1}{\sqrt{1 - x^2}}$$

$$10^{\circ} y = (x - 1)^2 \sqrt{x^2 + 2x - 1}$$

$$\text{Rép. } y' = \frac{(x - 1)(3x^2 + 4x - 3)}{\sqrt{x^2 + 2x - 1}}$$

$$11^{\circ} y = (1 - x) \sqrt[3]{2 + x^2} \quad \text{Rép. } y' = \frac{-(5x + 4)}{3\sqrt[3]{2 + x^2}}$$

$$12^{\circ} y = (3x - 2) \sqrt{(1 + 2x)^3}$$

$$y' = 3(5x - 1) \sqrt{1 + 2x}$$

$$13^{\circ} y = (2x - 3) \sqrt[3]{(x + 1)^2}$$

$$y' = \frac{10x}{3\sqrt[3]{x + 1}}$$

$$14^{\circ} y = (5x^2 - 6x + 9) \sqrt[3]{(x^2 + 1)^2}$$

$$\text{Rép. } y' = \frac{50x^3 - 42x^2 + 66x - 18}{3\sqrt[3]{x^2 + 1}}$$

$$15^{\circ} y = (3x - 4)^2 \sqrt[4]{(2x^2 + 1)^3}$$

$$\text{Rép. } y' = \frac{3(3x - 4)(7x^2 - 4x + 2)}{\sqrt[4]{2x^2 + 1}}$$

$$16^{\circ} y = (21x^2 - 24x + 32) \sqrt[4]{(2x^2 + 1)^3}$$

$$\text{Rép. } y' = \frac{147x^3 - 120x^2 + 138x - 24}{\sqrt[4]{2x^2 + 1}}$$

308. Calculer les dérivées des fonctions suivantes :

$$1^{\circ} y = \frac{\sqrt{x + 7}}{x}$$

$$\text{Rép. } y' = \frac{-x - 14}{2x^2 \sqrt{x + 7}}$$

$$2^{\circ} y = \frac{x}{\sqrt{4 - x^2}}$$

$$y' = \frac{4}{\sqrt{(4 - x^2)^3}}$$

$$3^{\circ} y = \frac{x}{\sqrt{(1 + x^2)^3}}$$

$$y' = \frac{1 - 2x^2}{\sqrt{(1 + x^2)^5}}$$

$$4^{\circ} y = \frac{x^3}{\sqrt{(1 - x^2)^3}}$$

$$y' = \frac{3x^2}{\sqrt{(1 - x^2)^5}}$$

$$5^{\circ} y = \sqrt{\frac{1 - x}{1 + x}}$$

$$y' = \frac{\sqrt{1 - x^2}}{(x + 1)^2 (x - 1)}$$

$$6^{\circ} y = x \sqrt{\frac{x}{3 - x}}$$

$$y' = \frac{(9 - 2x) \sqrt{x(3 - x)}}{2(3 - x)^2}$$

$$7^{\circ} y = \frac{3 + 2x}{\sqrt[3]{1 + x}}$$

$$y' = \frac{3 + 4x}{3\sqrt[3]{(1 + x)^4}}$$

$$8^{\circ} y = \frac{x(3 + 2x^2)}{3\sqrt{(1 + x^2)^3}}$$

$$\text{Rép. } y' = \frac{1}{\sqrt{(1 + x^2)^5}}$$

$$9^{\circ} y = \frac{(x^3 + 4) \sqrt{2 - x^2}}{3}$$

$$y' = \frac{-4x^4 + 6x^2 - 4x}{3\sqrt{2 - x^2}}$$

$$10^{\circ} y = \frac{(3 - 4x) \sqrt{3 + 2x}}{x\sqrt{x}}$$

$$y' = \frac{-27}{2x^2 \sqrt{x(3 + 2x)}}$$

$$11^{\circ} y = \frac{(1 + 2x^2) \sqrt{x^2 - 1}}{3x^3}$$

$$y' = \frac{1}{x^4 \sqrt{x^2 - 1}}$$

$$12^{\circ} y = \frac{(x - 1)^3 \sqrt[3]{x^3 + 1}}{(x + 1)^2}$$

$$\text{Rép. } y' = \frac{(x - 1)^2 (2x^3 + 3x^2 - 4x + 5)}{(x + 1)^2 \sqrt[3]{(x^3 + 1)^2}}$$

309. Calculer les dérivées des fonctions suivantes :

$$1^{\circ} y = \sin 3x$$

$$\text{Rép. } y' = 3 \cos 3x$$

$$2^{\circ} y = 2 \operatorname{tg} 2x$$

$$y' = \frac{4}{\cos^2 2x}$$

$$3^{\circ} y = \cos^2 2x$$

$$y' = -2 \sin 4x$$

$$4^{\circ} y = \operatorname{tg}^2 2x$$

$$y' = \frac{4 \sin 2x}{\cos^3 2x}$$

$$5^{\circ} y = \sqrt{\sin x}$$

$$y' = \frac{\cos x}{2\sqrt{\sin x}}$$

$$6^{\circ} y = \sqrt{\sin 5x}$$

$$y' = \frac{5 \cos 5x}{2\sqrt{\sin 5x}}$$

$$7^{\circ} y = \sqrt[3]{\cos^2 x}$$

$$y' = \frac{-2 \sin x}{3\sqrt[3]{\cos x}}$$

$$8^{\circ} y = x - \sin x \cos x$$

$$y' = 2 \sin^2 x$$

$$9^{\circ} y = 6 \cos^2 x + 6 \cos x$$

$$\text{Rép. } y' = -6 \sin x(1 + 2 \cos x)$$

$$10^{\circ} y = \cos^3(2x^3 + 3x)^2$$

$$\text{Rép. } y' = -18(2x^3 + 3x)(2x^2 + 1) \cos^2 \alpha \sin \alpha, \\ \alpha \text{ étant égal à } (2x^3 + 3x)^2.$$

$$11^{\circ} y = \cos^2 x - \sin x \cos x$$

$$\text{Rép. } y' = -(\sin 2x + \cos 2x)$$

$$12^{\circ} y = \sin x(\sin x - \cos x)$$

$$y' = \sin 2x - \cos 2x$$

$$13^{\circ} y = \cos x(\sin^2 x + 2)$$

$$y' = -3 \sin^3 x$$

$$14^{\circ} y = 2x \sin x - (x^2 - 2) \cos x$$

$$y' = x^2 \sin x$$

310. Calculer les dérivées des fonctions suivantes :

$$1^{\circ} y = \frac{\operatorname{tg} 2x}{\operatorname{tg} x}$$

$$\text{Rép. } y' = \frac{2 \sin 2x}{\cos^2 2x}$$

$$2^{\circ} y = \frac{\cos^2 2x}{\operatorname{tg} x}$$

$$y' = \frac{-\sin 2x \sin 4x - \cos^2 2x}{\sin^2 x}$$

$$3^{\circ} y = \frac{\cos x}{1 + \cos^2 x}$$

$$y' = \frac{-\sin^3 x}{(1 + \cos^2 x)^2}$$

$$A \quad 4^{\circ} y = \frac{\sin x}{1 + \operatorname{tg}^2 x}$$

$$y' = \cos x (3 \cos^2 x - 2)$$

$$5^{\circ} y = \frac{\cos x}{\sin^3 x} + 2 \cotg x$$

$$y' = \frac{-3}{\sin^4 x}$$

$$A \quad 6^{\circ} y = \frac{\sin x - x \cos x}{\cos x + x \sin x}$$

$$y' = \frac{x^2}{(\cos x + x \sin x)^2}$$

$$B \quad 7^{\circ} y = \frac{\cos x + x \sin x}{\sin x - x \cos x}$$

$$y' = \frac{-x^2}{(\sin x - x \cos x)^2}$$

$$8^{\circ} y = \frac{\operatorname{tg} x}{2 + (2x - 1) \operatorname{tg} x}$$

$$y' = \frac{2}{[2 + (2x - 1) \operatorname{tg} x]^2}$$

$$9^{\circ} y = \sqrt{\frac{1 + \sin x}{1 - \sin x}}$$

$$y' = \frac{\pm 1}{1 - \sin x}$$

C'est le signe + qu'il faut prendre quand x est compris entre $2k\pi$ et $2k\pi + \frac{\pi}{2}$ ou entre $2k\pi + \frac{3\pi}{2}$ et $2k\pi + 2\pi$; et le signe — quand x est compris entre $2k\pi + \frac{\pi}{2}$ et $2k\pi + \frac{3\pi}{2}$ (323, 9°).

$$10^{\circ} y = \sqrt{\frac{x \sin x}{1 - \cos x}}$$

$$y' = \frac{\sin x - x}{2\sqrt{x \sin x (1 - \cos x)}}$$

$$11^{\circ} y = \frac{\sin x}{\sqrt{2 \cos^2 x - \sin^2 x}}$$

$$y' = \frac{2 \cos x}{\sqrt{(2 \cos^2 x - \sin^2 x)^3}}$$

$$12^{\circ} y = \frac{\sin x \cos x}{\sqrt{3 \cos^2 x - 2 \sin^2 x}}$$

$$y' = \frac{3 \cos^4 x + 2 \sin^4 x}{\sqrt{(3 \cos^2 x - 2 \sin^2 x)^3}}$$