

سلسلة داعمه دول الاشتقاق

مشتقة الدوال المثلثية

احسب $f'(x)$ في الحالات التالية

1. $f(x) = \sin(3x)$
2. $f(x) = \cos(2x)$
3. $f(x) = \tan \frac{x}{2}$
4. $f(x) = 3\cotan(2x)$
5. $f(x) = \sec(x)$
6. $f(x) = \operatorname{cosec}(x)$
7. $f(x) = 3\cos(x^2)$
8. $f(x) = \sin(2x + \pi)$
9. $f(x) = \sin \frac{x-1}{x}$
10. $f(x) = \sin^3(2x)$
11. $f(x) = \cos^2(3x)$
12. $f(x) = \cotan^2 \frac{x}{3}$
13. $f(x) = x \tan^2 x$
14. $f(x) = \frac{\tan(1-x)}{2}$
15. $f(x) = (1 + \sin(2x))^2$
16. $f(x) = \cos(x) - \sin(3x)$
17. $f(x) = \sin \frac{x}{2} - \cos \frac{x}{3}$
18. $f(x) = \sin(2x) - 2\sin(x)$
19. $f(x) = \sin(2x) - \sin(4x)$
20. $f(x) = \frac{\cos(x)}{\sin(3x)} + 2\cotan(x)$

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الحلول:

1. $f'(x) = 3\cos(3x)$
2. $f'(x) = -2\sin(2x)$
3. $f'(x) = \frac{1}{2\cos^2\frac{x}{2}}$
4. $f'(x) = -\frac{6}{\sin^2(2x)}$
5. $f'(x) = \frac{\sin(x)}{\cos^2(x)}$
6. $f'(x) = -\frac{\cos(x)}{\sin^2(x)}$
7. $f'(x) = -6x\sin(x^2)$
8. $f'(x) = 2\cos(2x + \pi)$
9. $f'(x) = \frac{1}{x^2} \cos \frac{x-1}{x}$
10. $f'(x) = 6\cos(2x)\sin^2(2x)$
11. $f'(x) = -6\sin(3x)\cos(3x)$
12. $f'(x) = -\frac{2\cos\frac{x}{3}}{3\sin^3\frac{x}{3}}$
13. $f'(x) = \tan^2(x) + 2x\tan(x)\sec^2(x)$
14. $f'(x) = -\frac{1}{2\cos^2(1-x)}$
15. $f'(x) = 4\cos(2x)(\sin(2x) + 1)$
16. $f'(x) = -\sin(x) - 3\cos(3x)$
17. $f'(x) = \frac{1}{2}\cos\frac{x}{2} + \frac{1}{3}\sin\frac{x}{3}$
18. $f'(x) = 2\cos(2x) - 2\cos(x)$
19. $f'(x) = 2\cos(2x) - 4\cos(4x)$
20. $f'(x) = -\frac{\sin(x)\sin(3x) - 3\cos(x)\cos(3x)}{\sin^2(3x)} - \frac{2}{\sin^2(x)}$