

Find the derivative using the chain rule:

1. $y=(x^2+2x+3)^2$

2. $y=(x^4-4x^3+8)^7$

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

4. $y=(17x-50)^{1000}$

5. $y=\frac{1}{3x^2-5x+7}$

6. $y=\sqrt{4x^5-3x^3-2x}$

7. $y=\frac{2}{\sqrt{3x^4-5x^2}}$

8. $y=\sin(5x+2)$

9. $y=\cos(2x^2+3x+4)$

10. $y=\tan(3x^2-6)$

11. $y=\sec(3x-2)$

12. $y=\cos^4 x$

13. $y=\sin^2 x+\sin x^2$

14. $y=\sqrt{\tan x}$

15. $y=\sec^4 x$

16. $y=\sin(7x)$

17. $y=\cos(x^2+2x)$

18. $y=\tan(\sec x)$

19. $y=\sin^2(7x)$

20. $y=\sqrt{\cos(9x)}$

Answers and Hints: 1. $2(x^2+2x+3)(2x+2)$ 3. $-4(4x^3+3x^2-6x)^{-5}(12x^2+6x-6)$

5. hint: rewrite as $(3x^2-5x+7)^{-1}$ 7. $(2)(-1/2)(3x^4-5x^2)^{-3/2}(12x^3-10x)$

8. $\cos(5x+2)(5)$ 10. $\sec^2(3x^2-6)(6x)$ 12. hint: rewrite as $(\cos x)^4$, outer is $()^4$

13. $2(\sin x)(\cos x)+\cos(x^2)(2x)$ 14. hint: rewrite as $(\tan x)^{1/2}$ 16. $\cos(7x)(7)$

18. $[\sec^2(\sec x)](\sec x \tan x)$ 19. outer is $()^2$ so... $2(\sin 7x)\frac{d}{dx}(\sin 7x)..$