Practice Quiz
Derivatives of Trig Functions and Chain Rule

Find the derivative of each function. Be sure to indicate the derivative in proper notation. Do only the most obvious simplifications.

1. $y = \dfrac{3}{7}\cos x$

2. $y = \csc 5x$

3. $y = -3\sin^2 x$

4. $y = \tan 7x^2$

5. $y = 2x\cot x$

6. $y = \dfrac{x}{2\sin x}$

7. $y = \tan 8x + \cos\dfrac{1}{8}x$

8. $y = \cos^3 x^3$

9. $y = \cos(\sin x)$

10. $y = \cos^2(3x)\sin(4x)$

11. $y = \sin\sqrt[3]{3x}$

12. $y = \sqrt[3]{\sin 3x}$

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Find the derivative of each function. Be sure to indicate the derivative in proper notation. Do only the most obvious simplifications.

1. $y = \dfrac{3}{7}\cos x$	2. $y = \csc 5x$	3. $y = -3\sin^2 x$
Ans: $y' = -\dfrac{3}{7}\sin x$	Ans: $y' = -5\csc(5x)\cot(5x)$	Ans: $y' = -6\sin x \cos x$
4. $y = \tan 7x^2$	5. $y = 2x\cot x$	6. $y = \dfrac{x}{2\sin x}$
Ans: $y' = 14x\sec^2(7x^2)\tan(7x^2)$	Ans: $y' = -2x\csc^2 x + 2\cot x$	Ans: $y' = \dfrac{\sin x - x\cos x}{2\sin^2 x}$
7. $y = \tan 8x + \cos\dfrac{1}{8}x$	8. $y = \cos^3 x^3$	9. $y = \cos(\sin x)$
Ans: $y' = 8\sec^2(8x) - \dfrac{1}{8}\sin\left(\dfrac{1}{8}x\right)$	Ans: $y' = -9x^2\left[\cos(x^3)\right]^2\left[\sin(x^3)\right]$	$y' = -\sin(\sin x)(\cos x)$
10. $y = \cos^2(3x)\sin(4x)$	11. $y = \sin\sqrt[3]{3x}$	12. $y = \sqrt[3]{\sin 3x}$
Ans: $y' = \cos^2(3x)\cos(4x)\cdot 4 +$ $\quad \sin(4x)(2)\cos(3x)(-\sin 3x)\cdot 3$ $y' = 4\cos^2(3x)\cos(4x) +$ $\quad -6\sin(4x)\cos(3x)(\sin 3x)$	$y' = \cos(3x)^{1/3}\left(\dfrac{1}{3}(3x)^{-2/3}(3)\right)$ Ans: $y' = \dfrac{\cos(3x)^{\frac{1}{3}}}{(3x)^{\frac{2}{3}}}$	$y = \left[\sin(3x)\right]^{1/3}$ Ans: $y' = \dfrac{1}{3}\left[\sin(3x)\right]^{-2/3}\cos(3x)\cdot 3$ $y' = \dfrac{\cos(3x)}{\left[\sin(3x)\right]^{\frac{2}{3}}}$