More on Trig Derivatives and Chain Rule

Warm-up: Indicate the derivatives of the following trig functions.

1. $\dfrac{d}{dx}[\tan x]$

2. $\dfrac{d}{dx}[\csc x]$

3. $\dfrac{d}{dx}[\sin x]$

4. $\dfrac{d}{dx}[\sec x]$

5. $\dfrac{d}{dx}[\cot x]$

6. $\dfrac{d}{dx}[\cos x]$

Examples: Find the derivative of each function.

1. $y = 2\sin x$

2. $y = \sin 2x$

3. $y = \sin^2 x$

4. $y = \sin^2 2x$

5. $y = \sin\sqrt{x}$

6. $y = \sqrt{\sin x}$

7. $y = \sqrt{\sin 2x}$

Derivative by Table Example: Given the following information, find the following derivatives at $x = 2$.

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
2	-3	6	3	2
3	n/a	4	n/a	n/a

8. $y = [f(x)]^3$

9. $y = f(g(x))$

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Class Work: Take the derivatives of the following functions.

1. $y = \sin 3x$

2. $y = x \sin x$

3. $y = \cos\left(\dfrac{\pi}{2} - x\right)$

4. $y = \dfrac{\sin x}{x}$

5. $y = \dfrac{x}{\sin x}$

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

7. $y = \cos 2x - \sin 3x$

8. $y = \cos^4 x^4$

9. $y = \sin^2 x + \cos^2 x$

10. $y = \sqrt{\sin x + 2}$

11. $y = \tan\sqrt{3x - 1}$

12. $y = \sec\left(x^2 - 2x + 3\right)$

13) $y = \cot^4\left(\dfrac{x}{2}\right)$

14) $y = \dfrac{\sin x}{1 + \cos^2 x}$

15) $y = \sin(\cos x)$