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= Year 12   **= Calculus**   **= Worksheet 2**

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1. Find the derivative of $\cos\dfrac{2(1-x)}{3}$.

2. Differentiate $\sin\left(\dfrac{x^\circ}{\pi}\right)$ with respect to x.

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3. Find $f'(x)$, given $f(x)=\dfrac{1}{\pi}\tan\left(\dfrac{\pi x}{2}-1\right)$.

4. Find $\dfrac{d}{dx}\left[\tan(kx+1)\right]$, where k is a constant.

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5. Find $\dfrac{dy}{dx}$, where $y=2\cos\left(\dfrac{x}{2}\right)-\sin\left(\dfrac{2x}{3}-1\right)$.

6. Differentiate $\cos^2(x+1)$ with respect to x.

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7. Find $\dfrac{d}{dx}\left[\cos(x+1)^2\right]$.

8. Find $\dfrac{dy}{dx}$, where $y=\tan\sqrt{x+1}$.

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9. Find $\dfrac{d}{dy}\left(\dfrac{1}{\tan y}\right)$.

10. Differentiate $\sqrt{\tan(x+1)}$ with respect to x.

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11. Find $f'\left(\dfrac{\pi}{4}\right)$, given $f(x)=\dfrac{2}{\sqrt{\cos x}}$.

Numerical, algebraic and worded answers.

1. 2/3 sin[2(1−x)/3]
2. 1/180 cos(x°/π)
3. 1/2 sec²(πx/2−1)
4. k sec²(kx+1)
5. −sin(x/2)−2/3 cos(2x/3−1)
6. −2 sin(x+1)cos(x+1)
7. −2 (x+1)sin(x+1)²
8. sec²√(x+1) / 2√(x+1)
9. −1/sin²y or −sec²y/tan²y
10. sec²(x+1) / 2√tan(x+1)
11. 2^{1/4}

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