U3H2

Find the derivative of each function.

1. $y=(\sin(x-3))^{-1}$

2. $y=(4t-3)^{-8}$

3. $f(\theta)=\theta+2\tan\sqrt[3]{\theta}$

4. $g(z)=\sqrt[3]{2z-1}$

5. Find $\dfrac{d^2y}{dx^2}$ of $y=x\cos(5x)$.

Find the indicated derivative.

6. $\lambda=\left(\dfrac{au+b}{cu+d}\right)^6$; find $\dfrac{d\lambda}{du}$.
(a, b, c, d are constants)

7. $y=\cot^3(\pi-\theta)$; find $\dfrac{dy}{d\theta}$.

Find an equation for the tangent line to the graph at the specified point.

8. $y=x\cos(3x)$, $x=\pi$

9. $y=\left(x-\dfrac{1}{x}\right)^3$, $x=1$

Multiple Choice:

10. If $f(x)=\dfrac{1}{x^2+1}$ and $g(x)=\sqrt{x}$, then the derivative of $f(g(x))$ is:

a. $\dfrac{-\sqrt{x}}{(x^2+1)}$ b. $-(x+1)^{-2}$ c. $\dfrac{1}{(x+1)^2}$ d. $\dfrac{1}{2\sqrt{x}(x+1)}$

Homework #18 U3H2 answers

Find the derivative of each function. Simplify your final answer.

1. $y = \dfrac{1}{4\sin(x-3)}$

2. $y = (4t-3)^{-8}$

3. $f(\theta) = \theta + 2\tan\sqrt[3]{\theta}$

4. $g(z) = \sqrt[3]{2z-1}$

5. Find $\dfrac{d^2y}{dx^2}$ of $y = x\cos(5x)$ ~~$\sin x$~~.

Find the indicated derivative.

6. $\lambda = \left(\dfrac{au+b}{cu+d}\right)^6$; find $\dfrac{d\lambda}{du}$.
(a, b, c, d are constants)

7. $y = \cot^3(\pi - \theta)$; find $\dfrac{dy}{d\theta}$.

Find an equation for the tangent line to the graph at the specified point.

8. $y = x\cos(3x)$, $x = \pi$

9. $y = \left(x - \dfrac{1}{x}\right)^3$, $x = 1$

10. ~~$y = \sin x + \cos x$, $x = \pi$~~.

Multiple Choice:

11. If $f(x) = \dfrac{1}{x^2+1}$ and $g(x) = \sqrt{x}$, then the derivative of $f(g(x))$ is:

a. $\dfrac{-\sqrt{x}}{(x^2+1)}$ b. $-(x+1)^{-2}$ c. $\dfrac{1}{(x+1)^2}$ d. $\dfrac{1}{2\sqrt{x}(x+1)}$