PRINTABLE VERSION

Quiz 8

Question 1

Find the derivative of the function $G(x) = \left(4\,x^3 + 2\,x^2\right)^5$.

a) $G\,'(x) = 5\left(-4\,x^3 + 2\,x^2\right)^4$

b) $G\,'(x) = 5\left(12\,x^2 + 4\,x\right)^4$

c) $G\,'(x) = 5\left(4\,x^3 + 2\,x^2\right)^4\left(12\,x^2 + 4\,x\right)$

d) $G\,'(x) = \left(4\,x^3 + 2\,x^2\right)^4\left(12\,x^2 + 4\,x\right)$

e) $G\,'(x)$ does not exist.

Question 2

Find the derivative of the function $f(x) = 4\,x^2\cos(x) - x$.

a) $f\,'(x) = 8\,x\cos(x) - 4\,x^2\sin(x)$

b) $f\,'(x) = 8\,x\cos(x) - 4\,x^2\sin(x) - 1$

c) $f\,'(x) = -8\,x\cos(x) + 4\,x^2\sin(x) - 1$

d) $f\,'(x)$ does not exist.

e) $f\,'(x) = -8\,x\sin(x) - 1$

Question 3

Find $\dfrac{d^2}{dx^2}\left[\left(5\,x^2 - 4\,x\right)\cos(x)\right]$.

a) $(-5x^2 + 4x + 10)\sin(x) - (20x - 8)\cos(x)$

b) Does not exist.

c) $(-5x^2 + 4x + 10)\cos^2(x) - (20x - 8)\sin(x)$

d) $(10\,x - 4)\cos(x) - \left(5\,x^2 - 4\,x\right)\sin(x)$

e) $(-5x^2 + 4x + 10)\cos(x) - (20x - 8)\sin(x)$

Question 4

For $g(x) = \dfrac{1}{4x^2 + 5x}$, find $g\,'(2)$.

a) $\frac{1}{676}$

b) $\frac{676}{21}$

c) $\frac{21}{676}$

d) $-\frac{21}{676}$

e) $-\frac{1}{676}$

Question 5

$\frac{d}{dx}\left(\left(x^2-2x\right)\cdot\frac{d}{dx}\left(x+\frac{6}{x}\right)\right)=$

a) $3x^2-4x+6$

b) $2x-2-\frac{12}{x^2}$

c) $2x^2+12-2x-\frac{12}{x}$

d) $6x-4$

e) $2+\frac{24}{x^3}$

Question 6

Find $\frac{dy}{dx}$ at $x=0$ given $y=u+\frac{1}{u}$ and $u=(1x+1)^5$.

a) $\frac{dy}{dx}=0$

b) $\frac{dy}{dx}=-1$

c) $\frac{dy}{dx}=1$

d) $\frac{dy}{dx}=2$

e) $\frac{dy}{dx}=3$

Question 7

Evaluate $(g\circ f)'(9)$, given that:

$$\begin{array}{ll} f(8)=8 & f'(8)=8 \\ f(9)=9 & f'(9)=8 \\ f(10)=9 & f'(10)=9 \\ g(8)=8 & g'(8)=9 \\ g(9)=10 & g'(10)=10 \\ g(10)=9 & g'(10)=10 \end{array}$$

a) 79

b) 82

c) 81

d) 80

e) 83

Question 8

Express the deriviative $\frac{d}{dx}\left((f(2x))^2-1\right)$ in terms of f'.

a) $f(2x)\cdot f'(2x)$

b) $2\cdot f(2x)\cdot f'(2x)$

c) $4\cdot f(2x)\cdot f'(2x)$

d) $4x\cdot f'(2x)$

e) $4\cdot f'(2x)$

Question 9

Calculate the derivative of the given function $f(x)=4\sin^5(\sqrt{x})$

a) $f'(x)=20\cos(\sqrt{x})$

b) $f'(x)=\frac{40\sin^4(\sqrt{x})\cos(\sqrt{x})}{\sqrt{x}}$

c) $f'(x)=\frac{10\sin^4(\sqrt{x})\cos(\sqrt{x})}{\sqrt{x}}$

d) $f'(x)=20\sin^4(\sqrt{x})\cos(\sqrt{x})$

e) $f'(x)=\frac{10\cos(\sqrt{x})}{\sqrt{x}}$

Question 10

Find the equation of the tangent line for $f(x)=4\tan(x)$ at $x=\frac{\pi}{4}$

a) $y = 8\left(x - \frac{\pi}{4}\right) + 4$

b) $y = \left(x - \frac{\pi}{4}\right) + 4\sqrt{2}$

c) $y = 8\left(x - \frac{\pi}{4}\right)$

d) $y = 4\left(x - \frac{\pi}{4}\right) + 8$

e) $y = 4\left(x - \frac{\pi}{4}\right) + 4\sqrt{2}$

Question 11

Determine the value(s) of x between 0 and 2π where the tangent lines are horizontal for $f(x) = 10\sin(x) - 10\cos(x)$.

a) $x = \frac{3\pi}{4}$ and $x = \frac{5\pi}{4}$

b) $x = \frac{\pi}{4}$ and $x = \frac{5\pi}{4}$

c) $x = 0$ and $x = \pi$

d) $x = \frac{3\pi}{4}$ and $x = \frac{7\pi}{4}$

e) $x = \frac{\pi}{2}$ and $x = \frac{3\pi}{2}$