Math 2143 - Brief Calculus with Applications

Quiz #8 - 2008.03.04

Solutions

---

1. Compute the following limit.

$$\begin{aligned}\lim_{t\to 9}\frac{t-9}{3-\sqrt{t}} &= \lim_{t\to 9}\frac{t-9}{3-\sqrt{t}}\cdot\frac{3+\sqrt{t}}{3+\sqrt{t}}\\ &= \lim_{t\to 9}\frac{(t-9)(3+\sqrt{t})}{9-t}\\ &= \lim_{t\to 9}\frac{t-9}{t-9}\cdot\left(-(3+\sqrt{t})\right)\\ &= \lim_{t\to 9}\left(-(3+\sqrt{t})\right)\\ &= -6\end{aligned}$$

2. Compute the following derivatives:

a)

$$\frac{d}{dx}\left(f(x)\cdot g(x)\right) = f'(x)g(x) + f(x)g'(x)$$

b)

$$\frac{d}{dx}\frac{f(x)}{g(x)} = \frac{f'(x)g(x) - f(x)g'(x)}{(g(x))^2}$$