$$f'''(x) = \frac{-1}{4}\left(\frac{-3}{2}\right)x^{\frac{-5}{2}} = \frac{3}{8}x^{\frac{-5}{2}}$$

$$f^{(4)}(x) = \frac{3}{8}\left(\frac{-5}{2}\right)x^{\frac{-7}{2}} = \frac{-15}{16}x^{\frac{-7}{2}} = \frac{-15}{16\sqrt{x^7}}$$

25 If $f(x) = 16x^2 - x^3$, what is the rate of change of $f'(x)$ at $(1, 15)$?

$$f'(x) = 16(2)x - 3x^2$$
$$= 32x - 3x^2$$

we want the rate of change of $f'(x) = f''(x)$

$$= 32 - 3(2)x$$
$$= 32 - 6x$$

at $(1, 15)$ → $x = 1$ من نقطة

$$f''(1) = 32 - 6(1)$$
$$= \boxed{26}$$

39 The revenue (in thousands of dollars) from the sale of a product is:-

$$R = 15x + 30(4x + 1)^{-1} - 30$$

where x is the number of units.

(a) At what rate is the marginal revenue MR changing when the number of units being sold is 25?

9.18