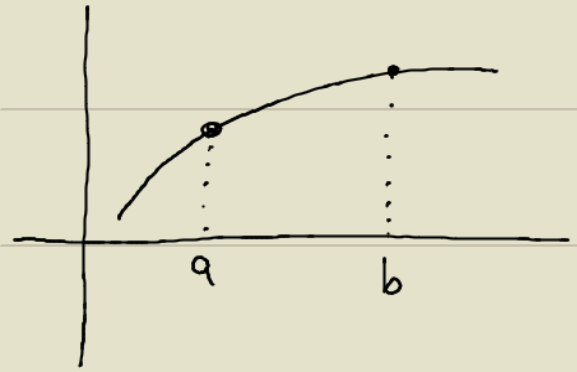

$$\text{RATE OF CHANGE} = \frac{\Delta y}{\Delta x} = \frac{f(b)-f(a)}{b-a}$$

1. $C = 200(3x + 4\sqrt{x})$

$C = 200(3x + 4x^{\frac{1}{2}})$

$\frac{dC}{dx} = 200(3 + 4 \cdot \frac{1}{2}x^{\frac{1}{2}-1})$

$= 200(3 + 2x^{-\frac{1}{2}})$

$\frac{dC}{dx} = 200\left(3 + \frac{2}{x^{\frac{1}{2}}}\right)$

$= 200\left(3 + \frac{2}{\sqrt{x}}\right)$

$= 200\left(\frac{3}{1} + \frac{2}{\sqrt{x}}\right)$

$= 200\left(\frac{3\sqrt{x}}{\sqrt{x}} + \frac{2}{\sqrt{x}}\right)$

$\frac{dC}{dx} = 200\left(\frac{3\sqrt{x}+2}{\sqrt{x}}\right)$

2. $R = 60(30x - x^{\frac{5}{2}})$

$\frac{dR}{dx} = 60\left(30 - \frac{5}{2}x^{\frac{5}{2}-1}\right)$

$= 60\left(30 - \frac{5}{2}x^{\frac{3}{2}}\right)$

$\frac{dR}{dx} = 1800 - 150x^{\frac{3}{2}}$

3. $P = -0.2x^3 + 40x^2 - 132.1x - 500$

$\frac{dP}{dx} = -0.2 \cdot 3x^2 + 40(2)x^1 - 132.1$

$= \boxed{-0.6x^2 + 80x - 132.1}$

4. $R = 3x(800 + 40x - x^2)$

$R = 2400x + 120x^2 - 3x^3$

b) $\frac{dR}{dx} = 2400 + 120(2)x^1 - 3(3)x^2$

$R'(x) = 2400 + 240x - 9x^2$

$R'(10) = 2400 + 240(10) - 9(10)^2$

$= 4800 - 900$

$= \boxed{3900}$

a) $x = 10$

$R = 2400(10) + 120(10)^2 - 3(10)^3$

$= 24000 + 12000 - 3000$

$= 33000$

$x = 11$

$R = 2400(11) + 120(11)^2 - 3(11)^3$

$= 36927$

$\frac{\Delta R}{\Delta x} = \frac{36927 - 33000}{11-10} = \boxed{3927}$