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1) a) $\int dR = \int \frac{2.358,96}{t} - \frac{12.756,78}{t^2} + 15.456,42 \cdot e^{-t} dt$

$R = 2.358,96 \int \frac{1}{t} dt - 12.756,78 \int \frac{1}{t^2} dt + 15.456,42 \int e^{-t} dt$

$R = 2.358,96 \cdot \ln(t) - 12.756,78 \cdot \frac{1}{t} + 15.456,42 \cdot -e^{-t} + C$

1) b) $R = 2.358 \cdot \ln(9) - 12.756,78 \cdot \frac{1}{9} + 15.456,42 \cdot -e^{-9} + 556.000$

$R = 5.183,2 - 1.417,42 - 1,907 + 556.000$

$R = 3.763,873 + 556.000$

$R = 559.763,873$

2) a)

$$\frac{dP}{dt} = \frac{3000}{1+0,25t}$$

$$\int dp = \int \frac{3000}{1+0,25t}\,dt$$

$u = 1+0,25t$ | $p = \int \frac{3000}{u} \cdot \frac{du}{0,25} = 1200 \int \frac{du}{u}$

$du = 0,25\,dt$

$$p = 12000 \ln u + C$$

$$p = 12000 \cdot \ln(1+0,25t) + C$$

$$p = 12000 \cdot \ln(1+0,25t) + 1000$$

2) b) $p \cong 7716$

2) c) $12000 = 12000 \ln(1+0,25t) + 1000$

$$11\cancel{000} = 12\cancel{000} \ln(1+0,25t)$$

$$\ln(1+0,25t) = \frac{11}{12}$$

$$e^{11/12} = 1+0,25t$$

$$2,5 = 1+0,25t \rightarrow t \cong \frac{1,5009}{0,25} \cong 6 \text{ dias}$$

3a) $\int dR = \int 6,972\, t^{1/2} - 0,40\, t^2 \, dt$

$R = 6,972 \int t^{1/2} - 0,4 \int t^2$

$R = 6,972 \cdot \frac{t^{3/2}}{3/2} - 0,4 \cdot \frac{t^3}{3}$

$R = 6,972 \cdot \frac{2t\sqrt{t}}{3} - 0,4 \cdot \frac{t^3}{3}$

a) $R = \frac{13,944\, t\sqrt{t}}{3} - \frac{0,4\, t^3}{3}$

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3) b) $R = \frac{13,944 \cdot 5\sqrt{5}}{3} - \frac{0,4 \cdot 5^3}{3} + 45,2$

$R = 69,72 \cdot 2,236 - \frac{50}{3} + 45,2$

$R = \frac{156}{3} - \frac{50}{3} = 52 - 16,67 = 35,3 + 45,2 = 80,5$

3) b) R = 80,5 bilhões