3. $C = 50000 + 3.1X \qquad R = 300X - 0.2X^2$

$X = 2000$

$\frac{300 \text{ TONS}}{1 \text{ WEEK}} \qquad \frac{dX}{dt} = 300$

$P = R - C$

$P = 300X - 0.2X^2 - (50000 + 3.1X)$

$= 300X - 0.2X^2 - 50000 - 3.1X$

$P = -0.2X^2 + 296.9X - 50000$

$X = 2000 \qquad \frac{dX}{dt} = 300$

a) $C = 50000 + 3.1X$

$\frac{d}{dt}(C) = \frac{d}{dt}(50000 + 3.1X)$

$\frac{dC}{dt} = 3.1 \frac{dX}{dt}$

$\frac{dC}{dt} = 3.1(300)$

$= 930$

$3.1 \times 300 = 930.0$

$2000 \times .4 = 800$

b) $R = 300X - 0.2X^2$

$\frac{d}{dt}[R] = \frac{d}{dt}(300X - 0.2X^2)$

$\frac{dR}{dt} = (300 - 0.4X)\frac{dX}{dt}$

$\frac{dR}{dt} = (300 - 0.4(2000)) \cdot 300$

$= (300 - 800) \cdot 300$

$= (-500)(300)$

$= -150000$

c) $P = -0.2X^2 + 296.9X - 50000$

$\frac{d}{dt}(P) = \frac{d}{dt}(-0.2X^2 + 296.9X - 50000)$

$\frac{dP}{dt} = (-0.4X + 296.9)\frac{dX}{dt}$

$\frac{dP}{dt} = (-0.4(2000) + 296.9) \cdot 300$

$= -150930$