

SOLUTION #2 (9 AM)

Solution 1. (1) $\text{dom}(f) = (-\infty, -1) \cup (-1, +\infty)$ (1pt)
 $\text{dom}(g) = [0, +\infty)$ (1pt)

(2) $(f \circ g)(x) = f(g(x)) = f(\sqrt{x} + 1) = \frac{\sqrt{x+1}}{\sqrt{x+1+1}} = \frac{\sqrt{x+1}}{\sqrt{x+2}}$ (1pt)
 $(g \circ f)(x) = g(f(x)) = g\left(\frac{x}{x+1}\right) = \sqrt{\frac{x}{x+1}} + 1$ (1pt)

Solution 2. (1) $C(x) = 400 + 4x$ (2pts)
 $P(x) = 6x$ (2pts)

(2) $C(x) = P(x)$ (1pt)
 $\implies 400 + 4x = 6x \implies 400 = 2x$
 $\implies x = 200$ units (1pt)

Errata:

(1) $C(x) = 400 + 4x$ (2pts)
 $R(x) = 6x$ (1pt)
 $P(x) = R(x) - C(x) = 6x - (400 + 4x) = 2x - 400$ (1pt)

(2) $C(x) = R(x)$ (1pt)
 $\implies 400 + 4x = 6x \implies 400 = 2x$
 $\implies x = 200$ units (1pt)