Section 2.5

42. a. rate of change = 10 gal/min
initial condition = 300 gal at $t=0$

$\boxed{g(t) = 10t + 300}$

b. $1300 = 10t + 300$

$1000 = 10t$

$100 = t$ minutes

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(50) $C(x)$ = cost in dollars for x chairs.

$C(x) = mx + b$ where m = slope or rate of change

b = y-intercept or initial condition

Because $C(100) = 2200$ and $C(300) = 4800$ we have

$$m = \frac{4800 - 2200}{300 - 100} = \frac{2600}{200} = 13 \ \frac{\text{dollars}}{\text{chair}}$$

Therefore $C - 2200 = 13(x - 100)$

$C(x) = 13x - 1300 + 2200$

(a) $\boxed{C(x) = 13x + 900}$

(c) $\boxed{13 \ \frac{\text{dollars}}{\text{chair}}}$

(b)