

① (a) The total change is  $\int_1^{10} 3t^2 dt = t^3 \Big|_{t=1}^{10} = 10^3 - 1^3 = \boxed{999}$ .

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(b)  $f(10) = f(1) + \int_1^{10} 3t^2 dt = 3,300 + 999 = \boxed{4,299}$ .

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② The average value is

$$\frac{1}{5-0} \int_0^5 (3500 - 700t) dt = \frac{1}{5} [3500t - 350t^2] \Big|_{t=0}^5$$
$$= \frac{1}{5} [17500 - 8750] = \boxed{\$1,750}$$

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③  $\int 3x^2 - 2x dx = \boxed{x^3 - x^2 + C}$

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④ The ~~more~~ total increase in value over 8 years

is:  $\int_0^8 50,000 e^{0.07t} dt = \frac{50,000}{0.07} [e^{0.07t}] \Big|_{t=0}^8$

$$= \frac{50,000}{0.07} [e^{0.56} - 1] \approx \boxed{\$536,194.64}$$

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