7. [11 points] Gretchken has managed to synthesize an even more powerful growth stimulant, Chemical Y. She administers it to a freshly hatched mealworm, and observes the mealworm's growth over the next few days. Let $M(t)$ denote the mass (in grams) of the mealworm t weeks after it hatches. Gretchken makes the following measurements. You do not have to show your work for this problem.

t	0	3	5
$M(t)$	18	24	32

a. [3 points] What type of function COULD $M(t)$ be? Circle *all* that apply. If none apply, circle "none of these".

linear **quadratic** exponential none of these

b. [4 points] Gretchken next tests Chemical Y on a silkworm. Let $S(t)$ be the mass (in grams) of the silkworm t weeks after it hatches. Give a practical interpretation of $S(t) = M(t+2)$.

Solution:
When both are on Chemical Y, the mass of a silkworm is equal to the mass of a mealworm that has hatched 2 weeks earlier.

c. [4 points] Gretchken tests Chemical Y on a cockroach. The cockroach weighs $C(t)$ grams t weeks after it hatches. Gretchken has found that $C(t)$ has the formula $C(t) = 2(1.3)^{2.5t-2}$. Leave your answers in exact form.

(i) The weekly growth factor of $C(t)$ is $1.3^{2.5}$.

(ii) The vertical intercept of $C(t)$ is $2 \cdot 1.3^{-2}$.