3. [9 points] Note that the problems on this page are not related to each other.
(You do not have to show work. However work shown may be used to award partial credit.)

a. [3 points] A salesperson at a local department store earns a base salary of $750 per
month plus a commission (bonus) of 8% of her total sales. Let $M(d)$ be the employee’s
total earnings, in dollars, in a month in which she sells $d$ dollars worth of merchandise.
Find a formula for $M(d)$.

**Answer:** $M(d) =$ _______________________________________________________________________

b. [3 points] Suppose that the half-life of caffeine in a student’s bloodstream is 5 hours. If
the student drinks a latte that contains 150 mg of caffeine at 8 am, find a formula for
$C(h)$, the amount of caffeine (in milligrams) from that latte that remains in the student’s
bloodstream $h$ hours after 8 am.

**Answer:** $C(h) =$ _______________________________________________________________________

c. [3 points] The monthly revenue of a local business varies seasonally from a low of $35,000
in February to a high of $75,000 in August (and back down to $35,000 the following
February). Let $R(t)$ be this company’s monthly revenue, in thousands of dollars, $t$ months
after January. (Note that $t = 0$ represents January, $t = 1$ represents February, etc.)
Assuming that $R(t)$ is a sinusoidal function, find a formula for $R(t)$.

**Answer:** $R(t) =$ _______________________________________________________________________