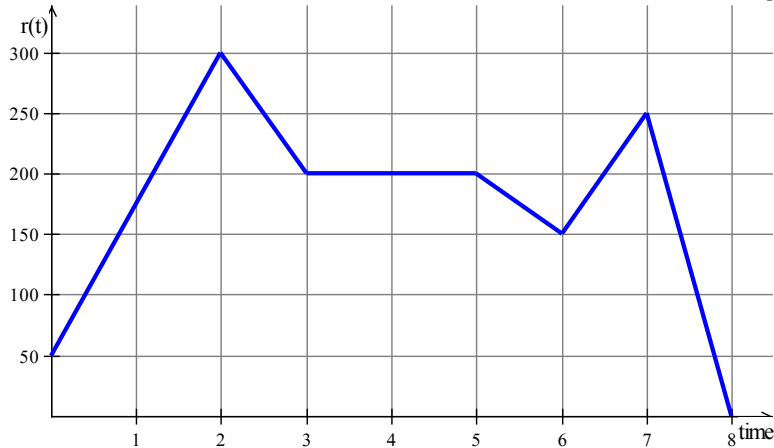


An evil former student who failed calculus (but passed AP Chemistry) has create a virus and infected all the teachers at Southwest High School. Initially 64 teachers were infected at 7 am ($t = 0$). The Zombie virus is passed through being poked by a special teacher appreciation day pen. The teachers are infecting students at a rate of 3 students per hour. Unfortunately, the student only got a 3 on the AP exam so his virus isn't foolproof, the Zombies are dying off at the rate $r(t)$ shown in the graph below. Time, t , is measured in hours from the time the teachers are infected. The zombies get off work at 3 pm.



(a) How many zombies were made in the first 2 hours? How many zombies are there after 2 hours?

(b) How many zombies died in the first 4 hours?

(c) How many zombies are "alive" after 4 hours?

(d) Are all the zombies dead at the end of the day? If no, how many are left to come back tomorrow?

(e) Is the number of zombies “alive” increasing or decreasing between $t = 4$ and $t = 5$?

(f) During what time intervals are the number of zombies at a relative maximum? Justify using calculus

(g) Find the value and Explain the meaning of $\frac{1}{8} \int_0^8 r(t) dt$