Answers to AP Bio Math Practice (Excluding Demos in class)

#2. Average Initial Mass = 30.26 g

Standard Deviation = 1.5034

Standard Error = .6138

#4. Chi Square Value @ 95% confidence = .28

I would accept the student’s hypothesis as the chi square value is less than the critical value of 7.82 at 3 degrees of freedom.

#5. Chi Square Value @ 95% confidence = 6.83

I would reject the hypothesis that red is dominant to white due to the chi square value being greater than the critical value of 3.84 @ 1 degree of freedom.

#7. p = .6

#8a. p = .7, q = .3

#8b. p2 = .49

#8c. p2 + 2pq = .91

#9. p = .47

#13. Block a SA:V = 2:1

Block b SA:V = 2:1

Block c SA:V = 2.5:1

Block d SA:V = 4.03:1

Vinegar penetrates furthest into block d because it has the highest surface area to volume ratio (leads to fastest diffusion rate)

Block a would have the greatest volume of phenolphthalein after ten minutes. Blocks a and b both have the slowest diffusion rates, but block a starts with a much larger volume of phenolphthalein.

#15. 800 mice/month

#16. As carrying capacity is approached by population size, the growth rate approaches 0. Another way to put this is that births come closer to equaling deaths.

#18. -1.6 Mpa

#19a. .0125 mg/sec

#19b. 0 mg/sec

#19c. There is no more substrate to be acted on by the enzyme so the rate = 0.

#19d. Adding more enzyme would not change the rate, rate is still = 0 mg/sec.

#19e. Adding more substrate would temporarily increase the rate of reaction from 0 mg/sec until the substrates were completely acted on by the enzymes, bringing the reaction rate back to 0.

#20. N = 1600, dN/dT = -106.7

N = 1750, dN/dT = -291.7

N = 2000, dN/dT = -666.7

All of the changes in population size are negative because each population starts at a size exceeding carrying capacity.

21. SKIP

22. pH of 5 is 10000x more acidic (10000x higher concentration of H+ ions.

23. pH of 8 has a concentration of 1 x 10-8 H+ ions.