Math 111 - Final Exam Review Solutions to Some Problems

2. 30 million; $5 \times 10^4 \times 4 \times 10^6 = 20 \times 10^{10} = 2 \times 10^{11}$.

3. 349.

4. 494 mod 26 = 0; 497 mod 26 = 3.

5. 54 tons.

6. About 600 dots.

7. Any five of the following: $..., -307, -207, -107, -7, 93, 193, 293, 393, 493, ...$

8. (a) 2 (b) 2 (c) 7 (d) 7 (e) 1

9. Monday

10. Eight times

11. (a) 8×10^8 (b) $0.08 \times 0.3 = 0.008 \times 3 = 0.024$ (c) 10^{21} (d) 600,000

13. Growing 50% means you keep 100% of what you had and add another 50%. So you end up with 150% of what you had. So you need to multiply by the **growth factor** 1.50 not 0.50.

14. (a) 400% (b) 35% (c) -52% (d) 160%

15. $1000\left(1 + \dfrac{0.03}{12}\right)^{120}$.

16. $2 \times 0.6 = 1.2$ which is 20% growth.

17. (a) Carmen would (b) No, no one has 15 votes. (c) Carmen (d) Carmen

18. If more than half of voters pick you first, then you will win every head-to-head match up, so you are Condorcet. On the other hand, Condorcet candidates are not always Majority candidates.

19. (a) Independence of Irrelevant Alternatives, (b) Monotonicity, (c) Condorcet Criterion

20. Rounding the normal way (since it is Webster's method) gives 6 for A, 18 for B, 24 for C, and 13 computers for D. That is a total of 61 computers, which is too many to give out. So the quotas are too high. To make them smaller, we need to **increase the divisor**.

21. $43\% + 13\% + 25\% + 4\% + 11\% + 4\% = 100\%$.

22. New States Paradox.

23. The multiplication rule applies to counting choices not physical objects.

24. ${}_{12}C_3 = 220$

25. ${}_NC_2$

26. HH $\frac{4}{9}$, HT $\frac{2}{9}$, TH $\frac{2}{9}$, TT $\frac{1}{9}$.

27. (a) 28, (b) 336, (c) 9900

28. The complimentary event would be to get 4 or fewer heads.