ANSWERS TO MA 137 FINAL EXAM REVIEW PROBLEMS

1. Set B contains **20** elements.
2. $A \cup C$ contains **30** elements.
3. $B \cup C'$ contains 20 + 7 + 8 = **35** elements.
4. $B' \cap C'$ contains 7 + 8 = 15 elements, so $A \cup (B' \cap C')$ contains 15 + 6 + 4 + 1 = **26** elements.
5. Robert paid $54 \div \frac{3}{2} = 54 \cdot \frac{2}{3} = \frac{54}{1} \cdot \frac{2}{3} =$ **$36** for the book.

6. Divide: $6\frac{3}{4} \div 1\frac{1}{2} = \frac{27}{4} \div \frac{3}{2} = \frac{27}{4} \cdot \frac{2}{3} = \frac{9}{2}$. So he can make **4** full batches. He will be left with $\frac{1}{2}$ of $1\frac{1}{2}$ pounds remaining. This means he has $\frac{1}{2} \cdot \frac{3}{2} = \frac{3}{4}$ pounds of flour left over.

7. Your sketch should have two long-flats and one flat. The numeral is **2100_{three}.**

8. $108 = 2^2 \cdot 3^3$ and $4536 = 2^3 \cdot 3^4 \cdot 7$
   GCD(108, 4536) = $2^2 \cdot 3^3 = 108$
   LCM(108, 4536) = $2^3 \cdot 3^4 \cdot 7 = 4536$

9. a. **True**: 6 • 2 = 12
   b. **True**: 12 • 5 = 60
   c. **True**: because 6 | 60.
   d. **True**: 6 = 3 • 2, and (3 • 2) • (2 • 7) = $2^2 \cdot 3 \cdot 7$
   e. **False**: 10 does not divide $2^2 \cdot 3 \cdot 7$ because 5 is not in its prime factorization.
   f. **False**: $50 \cdot \frac{1}{2} = 25$, but $\frac{1}{2}$ is not a whole number. (Note: "25 | 50" is a true statement.)

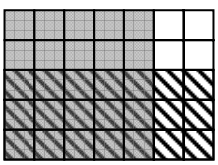
10. **$3825** was in the savings account.

11. **Four** rooms. Be careful with your units. Don't try to mix hours and minutes!

12. **$337.50**

13. a. Seniors are **1/4** of the class.
    b. Freshmen: **384**; Sophomores: **240**; Juniors: **96**; Seniors: **240**

14. The final answer should show one long-flat, three flats, three longs, and one unit. The numeral is **1331_{five}.**

15. 

$$\frac{3}{5} \cdot \frac{5}{7} = \frac{15}{35} = \frac{3}{7}$$

16. This problem essentially asks what is $\frac{1}{6}$ of $\frac{2}{5}$? This question is answered through multiplication: $\frac{2}{5}\times\frac{1}{6}=\frac{2}{30}=\frac{1}{15}$. So $\frac{1}{15}$ of the park is sand area.

17. First, since $3\frac{1}{2}$ acres are not available as potential home sites, subtract: $12\frac{2}{3}-3\frac{1}{2}=(12-3)+(\frac{2}{3}-\frac{1}{2})=9+(\frac{4}{6}-\frac{3}{6})=9\frac{1}{6}$ acres area available to be made into home sites. Now the questions is: how many $\frac{3}{5}$-acres home sites can we create from $9\frac{1}{6}$ acres. You should recognize this as the measurement concept of division: $9\frac{1}{6}\div\frac{3}{5}=\frac{55}{6}\div\frac{3}{5}=\frac{55}{6}\cdot\frac{5}{3}=\frac{275}{18}=15\frac{5}{18}$. So the developer can make 15 home sites. The leftover land can either be rolled into some common area or used to make a home site larger. A good side question is "how much extra land is left?" The answer is *not* $\frac{5}{18}$ of an acre!