MTH 396 final review problems

1. The gearshift on Maxine's rototiller was malfunctioning. She found that it would travel forward 4 feet in one minute, but then shift into reverse and go 3 feet back before the shift would allow her to put it in forward again. The backwards part also took a minute to complete. How long would it take Maxine to till a 13 foot section of her garden with this machine?

2. 2/3 of the students in the class wear glasses. If the number of students without glasses was tripled and the number of students with glasses was increased by 6, there would be an equal number of students with and without glasses. How many students wear glasses?

3. Jill, Randy, David and Lora performed in the musical *Oliver* last Friday. Saturday, and Sunday nights. A total of 750 people attended the three performances. More people attended each night than had attended the previous night, but the difference in attendance from one night to the next was not more than 10. Between the four of the actors, Jill, Randy, David, and Lora knew exactly one-third of Friday night's audience, exactly one-fourth of Saturday nights' audience, and exactly one-fifth of Sunday night's audience. Out of the 750 people who attended the three performances, how many people did the four of them know? What was the attendance figure for each night of the performance? Assume no one attended more than one performance.

4. Trivia took some fishbowls she'd bought to the flea market. In the first hour, she sold one-third of them and a third of one more. In the second hour, she sold half of them, and half of one more. In her third hour there, she sold one-third of them and a third of one more. The next hour, she sold half of them and half of one more. Finally, she sold the last two and went home. How many fishbowls did Trivia sell?

5. Al, George, Kathleen, and Chad counted ballots in Florida. They were each given a box of ballots. Each box contained the same number of ballots. Each person counted ballots at a constant rate. However, the rate at which each person counted was different. When Al finished counting all of his ballots, George had 54 ballots left to count, Kathleen had 90 ballots left to count, and Chad had 106 ballots left to count. When George finished counting all of his ballots, Kathleen had 45 ballots left to count and Chad had 65 ballots left to count. When Kathleen finished counting all of her ballots, how many ballots did Chad have left to count? How many ballots were in each box to start with?

6. A number of people in the Atlanta Braves organization got together recently for a party. Of those, one-twelfth were all-stars. Two-thirds of the all-stars were hitters. Of the people at the party, half were players. Half of the players were neither hitters nor all-stars. One-fourth of the hitters were all-stars. There were six hitters who were not all-stars. How many people were at the party? (Venn diagram)

7. In how many different ways can the Seattle Seahawks score 12 points in a football game? Points are scored as follows: A safety scores 2 points, A field goal 3 points, A touchdown 6 points, A point after a touchdown 1 point (a touchdown must be scored first)

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8. Thuy (the tallest) is older than Miguel (the lightest). Jerel (the oldest) is shorter than Nate (the heaviest). No one has the same rank in any category. For example, if someone is the second tallest, he can't also be the second heaviest or the second oldest. Rank the four roommates in each category: age, height, and weight.

9. There are 48 people at a party. There are seven times as many adults as children. There are twice as many females as males. If there are 5 girls (female children) at the party, how many men (male adults) are there?

10. Three adults and two kids want to cross a river by using a small canoe. The canoe can carry two kids or one adult. What is the fewest number of times the canoe must cross the river to get everyone to the other side?

11. Abbie, Bridget, Cynthia and Dena are women whose professions are water quality engineer, soil contamination scientist, air pollution consultant and biological diversity advocate. Match each woman to her expertise, using the follow clues.
    1. Bridget and the biological diversity advocate are both from Oregon.
    2. Abbie, the soil contamination scientist and the air pollution consultant all love to garden.
    3. The air pollution expert, the water quality engineer and Dena all met one another at a global warming conference.
    4. Bridget has never met the person who works on air pollution.

    Answers:

    1. 19 minutes
    2. 12 students
    3. The actors knew 195 people. The attendance figures were 243,252,255.
    4. 26 fishbowls
    5. Chad will have 24 ballots left. There were 270 to start.
    6. 36 people
    7. 18 ways
    8. Age: Jerel (oldest), Thuy, Miguel, Nate; Height: Thuy(tallest), Miguel, Nate, Jerel; Weight: Nate(heaviest), Jerel, Thuy, Miguel
    9. 15 men
    10. 13 trips (one-way trips)
    11. Abbie:water; Bridget: soil; Cynthia: air; Dena: bio