UNIT 16 EXERCISES 6-10

FRACTIONS

2014B 6. **Answer (D):** Let a be the amount in a regular lemonade. Then a large lemonade holds $\frac{3}{2}a$, and Ann had $\frac{1}{4} \cdot \frac{3}{2}a = \frac{3}{8}a$ lemonade left right before she gave Ed part of her drink. She gave him $\frac{1}{3} \cdot \frac{3}{8}a + 2 = \frac{1}{8}a + 2$ ounces. Because Ann and Ed drank the same amount of lemonade, it follows that $a + (\frac{1}{8}a + 2) = \frac{3}{2}a - (\frac{1}{8}a + 2)$, and $4 = \frac{1}{4}a$. Thus $a = 16$ ounces, $\frac{3}{2}a = 24$ ounces, and together they drank $16 + 24 = 40$ ounces.

2001 7. **(A)** Let n be the number of full-price tickets and p be the price of each in dollars. Then

$$np + (140 - n) \cdot \frac{p}{2} = 2001, \text{ so } p(n + 140) = 4002.$$

Thus $n + 140$ must be a factor of $4002 = 2 \cdot 3 \cdot 23 \cdot 29$. Since $0 \leq n \leq 140$, we have $140 \leq n + 140 \leq 280$, and the only factor of 4002 that is in the required range for $n + 140$ is $174 = 2 \cdot 3 \cdot 29$. Therefore, $n + 140 = 174$, so $n = 34$ and $p = 23$. The money raised by the full-price tickets is $34 \cdot 23 = 782$ dollars.

2009B 8. **Answer (E):** Let x be the weight of the bucket and let y be the weight of the water in a full bucket. Then we are given that $x + \frac{2}{3}y = a$ and $x + \frac{1}{2}y = b$. Hence $\frac{1}{6}y = a - b$, so $y = 6a - 6b$. Thus $x = b - \frac{1}{2}(6a - 6b) = -3a + 4b$. Finally, $x + y = 3a - 2b$.

OR

The difference between a kg and b kg is the weight of water that would fill $\frac{1}{6}$ of a bucket. So the weight of water that would fill $\frac{1}{2}$ of a bucket is $3(a - b)$. Therefore the weight of a bucket filled with water is $b + 3(a - b) = 3a - 2b$.

2002A 10. **(D)** After the first transfer, the first cup contains two ounces of coffee, and the second cup contains two ounces of coffee and four ounces of cream. After the second transfer, the first cup contains $2 + (1/2)(2) = 3$ ounces of coffee and $(1/2)(4) = 2$ ounces of cream. Therefore, the fraction of the liquid in the first cup that is cream is $2/(2 + 3) = 2/5$.