

## Homework Solutions

### Chapter 1 – Page 67

#### Exercise 16

- (a) The significance level is  $\alpha = 2/30$  because in Bag E (which is  $H_0$ ) there are 2 vouchers with values  $\leq 1$  or  $\geq 10$ .
- (b) There are 6 vouchers with values  $\leq 3$ , but the value \$8 is just as extreme as \$3 and there are 6 vouchers with values  $\geq 8$ . So the  $p$ -value of \$3 is  $12/30$ .
- (c) (i) A Type II error is to believe it is Bag E when it really is Bag G or Bag H. If the bag is Bag G and we choose a voucher worth from \$2 to \$9, then we will mistakenly conclude that it was from Bag E. There are 23 such vouchers in Bag G, so  $\beta = 23/30$ .
- (ii) This is almost identical to the previous part. It is just in the opposite direction. If the bag really is Bag H, then there is a probability of  $23/30$  that we will choose a voucher worth from \$2 to \$9 and mistakenly conclude that it came from Bag E. So  $\beta = 23/30$ .