

ECE 302 Quiz 1  
(10 points)

Name: Solution (3 points)

06/17/2016

1. A random experiment has sample space  $S = \{a, b, c, d\}$ . Suppose that  $\Pr(\{c, d\}) = 3/8$ ,  $\Pr(\{b, c\}) = 6/8$ , and  $\Pr(\{d\}) = 1/8$ . Use the axioms of probability to find the specified probabilities. Show all work.

(a)  $\Pr(\{a\}) = \underline{1/8}$  (2 points)

(b)  $\Pr(\{c\}) = \underline{1/4}$  (3 points)

(c)  $\Pr(\{b\}) = \underline{1/2}$  (2 points)

(a) 
$$1 = \Pr(S) = \Pr(\{a\}) + \Pr(\{b, c\}) + \Pr(\{d\})$$
$$= \Pr(\{a\}) + 6/8 + 1/8$$
$$\Rightarrow \Pr(\{a\}) = 1/8$$

(b) 
$$3/8 = \Pr(\{c, d\}) = \Pr(\{c\}) + \Pr(\{d\})$$
$$= \Pr(\{c\}) + 1/8$$
$$\Rightarrow \Pr(\{c\}) = 1/4$$

(c) 
$$6/8 = \Pr(\{b, c\}) = \Pr(\{b\}) + \Pr(\{c\})$$
$$= \Pr(\{b\}) + 1/4$$
$$\Rightarrow \Pr(\{b\}) = 1/2$$