Suppose E, F, and G are events in a sample space S. If $E \cup F$ and EF and G^c all occur, then which of the following events also must occur?

(a) $E \cup G$

(b) EF^c

(c) $S - F$

(d) EFG

(e) FG

(f) EG

(g) EF^cG

(h) $(E \cup F \cup G)^c$

(i) $G - E$

(j) G

(k) None of these

Suppose a bucket contains three apples, one banana, two pears and three grapes, and you pick one unknown piece of fruit equally likely from the bucket at random. Denote the sample space by $S = \{\text{apple}, \text{banana}, \text{pear}, \text{grape}\}$. Which of the following events has twice the probability of occuring as the event that we pick an apple?

(a) $\{\text{apple}, \text{banana}, \text{pear}\}$

(b) $\{\text{banana}\}$

(c) $\{\text{grape}\}$

(d) $\{\text{banana}, \text{grape}\}$

(e) $\{\text{apple}, \text{banana}, \text{grape}\}$

(f) $\{\text{pear}, \text{grape}\}$

(g) $\{\text{pear}\}$

(h) $\{\text{apple}, \text{banana}\}$

(i) $\{\text{apple}, \text{pear}\}$

(j) S

(k) None of these

Let $S = \{1, 2, 3, \ldots, 100\}$ be a sample space with equally likely outcomes. If we conduct an experiment with this sample space, what is the probability the outcome is a multiple of both 6 and 10?

(a) 3/100

(b) 1/100

(c) 1/50

(d) 1/25

(e) 1/20

(f) 3/50

(g) 1/2

(h) 1/10

(i) 1/6

(j) 1/3

(k) 1/60

(l) 1/16

(m) 0

(n) 1

(o) None of these