(Note: The same setup is used for all three problems on this quiz.)
Suppose a box contains 4 coins, namely one penny, one nickel, one dime, and one quarter. You reach into the box and pick one coin, each coin being equally likely. What is the probability the coin you pick has value less than 12 cents and is either a penny or quarter?

(a) 1/4

(b) 1

(c) 0

(d) 1/2

(e) 1/3

(f) 3/4

(g) 2/3

(h) 1/8

(i) 3/8

(j) 5/8

(k) 3/5

(l) None of these

$S = \{p, n, d, q\}$, $|S| = 4$

$E = \{p, n, d\}$

$F = \{p, q\}$

$P(E \cap F) = \frac{1}{|S|} = \frac{1}{4}$

(Note: The same setup is used for all three problems on this quiz.)
Suppose a box contains 4 coins, namely one penny, one nickel, one dime, and one quarter. You reach into the box and pick one coin, each coin being equally likely. What is the probability the coin you pick has value less than 12 cents given it is not a nickel?

(a) 2/3

(b) 1/4

(c) 1

(d) 0

(e) 1/2

(f) 1/3

(g) 3/4

(h) 1/8

(i) 3/8

(j) 5/8

(k) 3/5

(l) None of these

$S = \{p, n, d, q\}$, $|S| = 4$

$E = \{p, n, d\}$

$F = n' = \{p, d, q\}$

$$P(E|F) = \frac{P(EF)}{P(F)} = \frac{\frac{1}{2}}{\frac{3}{4}} = \frac{4}{6} = \frac{2}{3}$$

(Note: The same setup is used for all three problems on this quiz.)
Suppose a box contains 4 coins, namely one penny, one nickel, one dime, and one quarter. You reach into the box and pick two coins without replacement, each coin being equally likely. What is the probability neither coin is a dime, given neither coin is a penny?

(a) None of these

(b) 3/5

(c) 1/4

(d) 1

(e) 0

(f) 1/2

(g) 2/3

(h) 3/4

(i) 1/8

(j) 3/8

(k) 5/8

(l) 3/5

$S = \{p, n, d, q\}$, $|S| = 4$

$E = d' = \{p, n, q\}$

$F = p' = \{n, d, q\}$

$P(E|F) \cdot P(E|F)$

$P(E|F) = \frac{P(EF)}{P(F)} = \frac{\frac{1}{4}}{\frac{3}{4}} = \frac{1}{3}$

$\left(\frac{1}{3}\right)^2 = \frac{1}{9}$