Assignment: Probability

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16.4.3 [1]A die has two faces each with number '1', three faces each with number '2' and one face with number '3'. If die is rolled once, determine

(a) $\Pr(2)$

(b) $\Pr(1 or 3)$

(c) $\Pr(not 3)$

Solution:

Variable	Value	Description
X_1	1	Face '1' of a die
X_2	2	Face '2' of a die
X_3	3	Face '3' of a die

Table 2: Variable Description.

Probability	Value
$\Pr(X_1)$	$\frac{1}{3}$
$\Pr(X_2)$	$\frac{1}{2}$
$\Pr(X_3)$	$\frac{1}{6}$

Table 4: Probabilities of $X_1, X_2 and X_3$.

(a)

$$\Pr(X_2) = \frac{1}{2} \tag{16.4.1.1}$$

[1]Read question numbers as (CHAPTER NUMBER).(EXERCISE NUMBER).(QUESTION NUMBER)

(b)

$$\Pr(X_1 + X_3) = \Pr(X_1) + \Pr(X_3) - \Pr(X_1 X_3) \tag{16.4.2.2}$$

$$= \frac{1}{3} + \frac{1}{6} (\because \Pr(X_1 X_3) = 0) \tag{16.4.2.3}$$

$$= \frac{3}{6} \tag{16.4.2.4}$$

$$\Pr(X_1 + X_3) = \frac{1}{2} \tag{16.4.2.5}$$

(c)

$$\Pr(X_3)\prime = 1 - \Pr(X_3) \tag{16.4.3.6}$$

$$= 1 - \frac{1}{6} \tag{16.4.3.7}$$

$$= \frac{5}{6} \tag{16.4.3.8}$$