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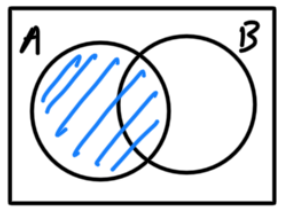
5.2

1. (a) P(A)

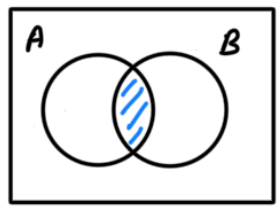


$6 + 5 = 11$

$6 + 5 + 3 + 1 = 15$

$P(A)\ {}^{11}/_{15}$

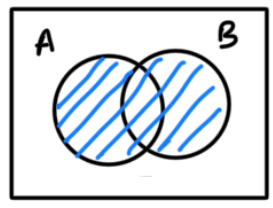
(b) P(A and B)



${}^{5}/_{(6+5+3+1)}$

$P(A \text{ and } B) = {}^{5}/_{15} = {}^{1}/_{3}$

(c) P(A or B)

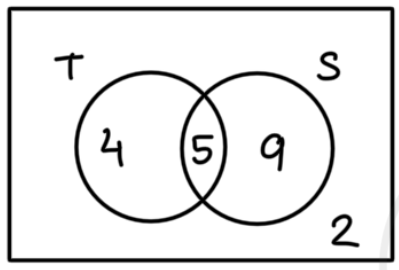


$6 + 5 + 3 = 14$

$6 + 5 + 3 + 1 = 15$

$P(A \text{ or } B) = {}^{14}/_{15}$

2.



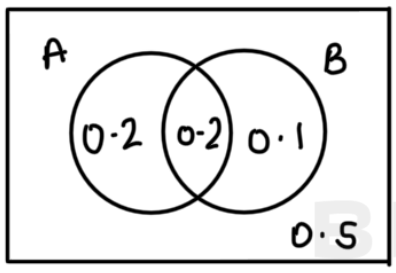
tapioca : $9 - 5 = 4$

semolina: $14 - 5 = 9$

Both : 5

neither : $20 - 4 - 9 - 5 = 2$

3.



$P(A \text{ and } B) = 0.2$

$P(\text{not } B, \text{not } A) = 0.5$

$P(A, \text{not } B) = 2 \times P(B, \text{not } A)$

let $P(B \text{ not } A) = x$

so $P(A, \text{not } B) = 2x$

$P(A, \text{not } B) + P(B, \text{not } A) + P(A \text{ and } B) = 0.5$

$2x + x + 0.2 = 0.5$

$2x + x = 0.5 - 0.2$

$3x = 0.3$

$x = 0.1$

so $P(B, \text{not } A) = 0.1$

$P(A, \text{not } B) = 0.2$

4. (a) $0.8 + 0.3 + x = 0.9$

$x = 0.9 - 0.8 - 0.3$

$x = -0.2$

$x \neq$ a negative probability

so $x = 0.2$

the probability that the passenger watches both the movie and the documentary is 0.2.

(b) $P(\text{Nature, not movie}) = 0.3 - 0.2$
$= 0.1$

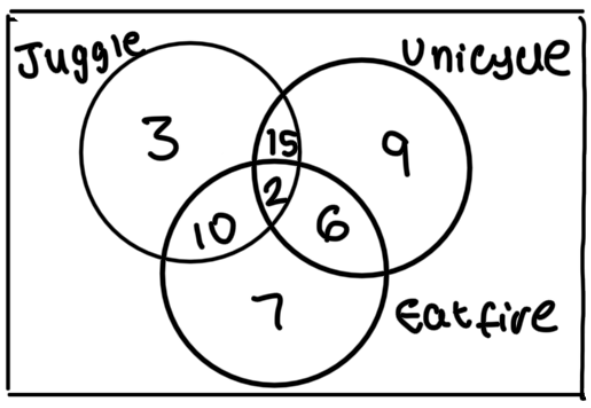
5. (a) $P(C) = 0.5$
$P(C) = 0.35 + x = 0.5$
$x = 0.5 - 0.35$
$x = 0.15$

(b) $P(B) = 1 - 0.1 - 0.15 - 0.02$
$P(B) = 0.73$
$P(B) = 0.2 + y + 0.35 = 0.73$
$y = 0.73 - 0.2 - 0.35$
$y = 0.18$

6. (a) 30 people juggle so P(juggling):
$30/70 = 3/7$

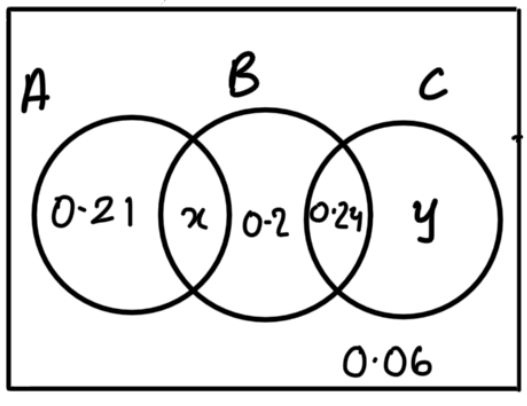
(b) P(juggling) + P(unicycle) − P(both)
$= 30 + 32 - 17$
$= 45$
$45/70 = 9/14$

(c) $\frac{7}{70} \rightarrow \frac{1}{10}$



(d) $70 - (3 + 10 + 2 + 15 + 7 + 6 + 9) = 18$
$\frac{18}{70} = \frac{9}{35}$

7.



(a)
$P(B) = 0.62$
$P(B) = x + 0.2 + 0.24 = 0.62$
$P(B) = 0.44 + x = 0.62$
$0.44 + x = 0.62$
$x = 0.62 - 0.44$

$x = 0.18$

$y = 1 - 0.21 - 0.18 - 0.2 - 0.24 - 0.06$

$y = 1 - 0.89$

$y = 0.11$

(b) $0.21 + 0.11 = 0.32$

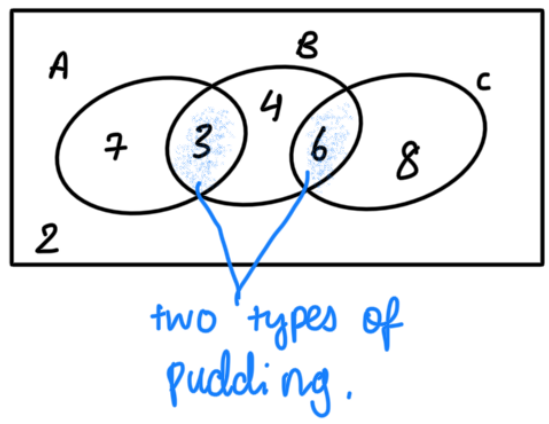
8. (a)

$P(A \text{ and } B) + P(B + C)$

$3 + 6$

$= 9$

$9/30 = 3/10$



(b) $P(A) + P(B)$

$= 7 + 3 + 4 + 6$

$= 20$

$20/30 = 2/3$

(c) $6/30 = 1/5$