i) Let A be good weather tomorrow.

a) The odds against A are given by $\frac{P(A')}{P(A)}$

@ The odds of good weather tomorrow (A) is 3:2

$$P(A) = \frac{3}{3+2} = 3/5.$$

$$P(A') = 1 - 3/5 = 2/5$$

∴ The odds against good weather tomorrow is;

$$2/5 \div 3/5 = 2/5 \times 5/3 = 2/3$$

$$\frac{P(A')}{P(A)} = 2/3.$$

b) Probability of good weather tomorrow, $P(A) = \frac{h}{h+k}$

$h = 3$, $K = 2$

$$P(A) = 3/3+2 = 3/5$$

2) Let K be Toronto Argonauts winning the Grey Cup.

Odds against $K = \frac{P(K')}{P(K)} = 19:1$

$P(K') = \frac{19}{19+1} = 19/20$

$= 19/20$

$P(K) = 1 - P(K') = 1 - 19/20 = 1/20$

$\therefore P(K) = 1/20$

3) a) 12

$B = \frac{P(B)}{P(B')}$

$P(B)$ = Probability of getting a sum of 12 after 2 dice are rolled

$P(B) = 1/36$

$P(B') = 1 - 1/36 = 35/36$

odds in favour of $B = \frac{P(B)}{P(B')} = 1/36 \div 35/36 = 1/36 \times 36/35 = 1/35 = 1:35$

3

b) 5 or less

let P(B) be the probability of rolling 2 dice and getting 5 or les

$P(B) = 4/36 = 1/9$

$P(B') = 1 - 1/9 = 8/9$

odds in favour of $B = \frac{P(B)}{P(B')} = 1/9 \div 8/9 = 1/9 \times 9/8 = 1/8$

$= 1/8 = 1:8$

c) A prime number

Let P(A) be the probability of rolling 2 dice and getting a prime number.

$P(A) = 15/36 = 5/12$.

$P(A') = 1 - 5/12 = 7/12$

odds in favour of $A = \frac{P(A)}{P(A')} = 5/12 \div 7/12 = 5/12 \times 12/7 = 5/7$

$= 5/7 = 5:7$

3.
d) 1

let K be the probability of ~~not~~ tossing a one after two dice are rolled.

The probability of not getting a one from both dice is $(5/6)^2 = 25/36$.

$\therefore P(K) = 1 - 25/36 = 11/36$

odds in favour of $K = \frac{P(K)}{P(K')} = 11/36 \div 25/36 = 11/36 \times 36/25 = 11/25$.

$= 11/25$. $= 11 : 25$

4) let P(A) be the probability of new year's day falling on a Friday.

$P(A) = 1/7$

$P(A') = 1 - 1/7 = 6/7$

odds in favour of $A = \frac{P(A)}{P(A')} = 1/7 \div 6/7 = 1/7 \times 7/6 = 1/6$

$= 1/6$ $= 1 : 6$.

4 b) Tossing three tails with 3 coins.

P(A) = The probability of tossing three tails with 3 coins.

$P(A) = 1/2 \times 1/2 \times 1/2 = 1/8$

$P(A') = 1 - 1/8 = 7/8$

$\therefore$ odds in favour of $A = \frac{P(A)}{P(A')} = 1/8 \div 7/8 = 1/8 \times 8/7 = 1/7$

$= 1/7 \quad = 1:7$

c) Not tossing exactly two heads with three coins.

P(A) = Probability of not tossing exactly two heads with three coins.

HHH	HTT
HTH	TTH
HHT	THT
THH	TTT

$P(A) = 5/8$

$P(A') = 1 - 5/8 = 3/5$

odds in favour of $A = \frac{P(A)}{P(A')} = 5/8 \div 3/8 = 5/8 \times 8/3 = 5/3$

$= 5/3 \quad = 5:3$

d) Randomly drawing a black 6 from a complete deck of 52 cards.

$P(A) = 1/52$.

$P(A') = 51/52$.

odds in favour of $A = \frac{P(A)}{P(A')} = 1/52 \div 51/52 = 1/52 \times \frac{52}{51} = 1/51$

$= 1/51 \quad = 1:51$

4. c) A random number from 1 to 9 inclusive being even.

1 (2) 3 (4) 5 (6) 7 (8) 9

$P(A) = 4/9$

$P(A') = 1 - 4/9 = 5/9$

$\therefore$ odds in favour of $A = \frac{P(A)}{P(A')} = 4/9 \div 5/9 = 4/9 \times 9/5 = 4/5$

$= 4/5$ or $= 4:5$

5) Total number of possibilities ~~are~~ $= 11$

a) Probability of drawing a V-neck T-shirt $\therefore P(V) = 6/11$

$P(V') = 1 - 6/11 = 5/11$

Odds in favour of $V = \frac{P(V)}{P(V')} = 6/11 \div 5/11 = 6/11 \times 11/5 = 6/5$

$= 6/5$ or $= 6:5$

b) Not drawing a tank top

$P(T') = 3/11$

$P(T) = 1 - 3/11 = 7/11$

odds in favour of $T = \frac{P(T)}{P(T')} = 7/11 \div 3/11 = 7/11 \times 11/3 = 7/3$

$= 7/3 = 7:3$

6) let K = Boris beating Elena in a chess game.

odds in favour of K are 5:4

$P(K) = \frac{5}{5+4} = 5/9$

$P(K') = 1 - 5/9 = 4/9$

$P(K') = 4/9$.

9) Let A = Toronto Maple Leafs Winning the Stanley Cup.
odds in favour of A = 1:5

Let B = Montreal Canadiens winning the Stanley Cup.
odds in favour of B = 2:13

$P(A) = \frac{1}{1+5} = 1/6$.

$P(A') = 1 - 1/6 = 5/6$

$P(B) = \frac{2}{2+13} = 2/15$.

$P(B') = 1 - 2/15 = 13/15$

$P(A \text{ or } B) \quad 1/6_3 \times 2^1/_{15} = 1/45$

$P(A \text{ or } B)' = 1 - 1/45 = 44/45$

10) a) A face card from a standard deck.

P(N) = Probability of drawing a face card from a standard deck.

$P(N) = 12/52$

$P(N') = 1 - 12/52 = 40/52$

Odds against $N = \frac{P(N')}{P(N)} = 40/52 \div 12/52 = 40/52 \times 52/12 = 40/12 = 10/3$

Odds against $N = 10/3 = 10:3$

b) Two face cards.

P(T) = Probability of drawing two face cards.

$P(T) = \cancel{12}^{3}/52 \times 11/\cancel{52}_{13} = \frac{33}{676}$

$P(T') = 1 - 33/676 = 643/676$

Odds against $T = \frac{P(T')}{P(T)} = \frac{643}{676} \div 33/676 = \frac{643}{676} \times \frac{676}{33} = 643/33$

$= 643/33 = 643:33$

11.a) $P(6) = 0.56$.

b) ~~Odds in favour~~ Probability of ~~both~~ tossing a prime number in a fair dice $= 3/6 = 1/2$

~~Odds in favour~~ Probability of tossing a prime number in a loaded dice is $1/2$

∴ I agree with the claim since the odds in favour for both die respectively is 1

c) The game that I would device would involve cards from a standard deck of cards. It would involve drawing a diamond a flower and a queen.

Probability of drawing a diamond $= 12/52$.

Probability of drawing a flower $= 12/52$.

Probability of drawing of queen $= 4/52$.

12/a)

12. $P(N)$ = Probability of rain the next day if George waters the lawn.
$P(K)$ = Probability of rain if he washes the car.
$P(G)$ = Probability of rain if he plans a trip to the beach.

$P(N) = 0.3$ $\quad P(N') = 0.7$

$P(K) = 0.4$ $\quad P(K') = 0.6$

$P(G) = 0.5$ $\quad P(G') = 0.5$

a) Odds in favour of rain tomorrow if he waters the lawn.

$$= \frac{P(N)}{P(N')} = 0.3/0.7 = 3/7$$

$$= 3:7$$

b) Odds in favour of the rain tomorrow if he washes the car.

$$= \frac{P(K)}{P(K')} = \frac{0.4}{0.6} = 4/6 = 2/3$$

$$= 2:3$$

c) Odds against rain tomorrow if he plans a trip to the beach.

$$= \frac{P(G')}{P(G)} = \frac{0.5}{0.5} = 1$$

The odds are 1.