Take Point in Matches

The way of calculating a Takepoint in backgammon in Match Play is to look at the probabilities for winning the match at certain scores, also called Match Equities and combining it with the actual scores.

When offered a doubling 3 actions can happen:

1. You can drop the double and lose point
2. You can take the double and win the current game
3. You can take the double and lose the current game

Or in other words: The probability of winning a match doing a take should be greater than doing a drop. The mathematical equations for that are:

$$P(Take) > P(Drop)$$

$$P_t Eq(TW) + (1 - P_t) Eq(TL) > Eq(D)$$

$$P_t [Eq(TW) - Eq(TL)] > Eq(D) - Eq(TL)$$

$$P_t > \frac{Eq(D) - Eq(TL)}{Eq(TW) - Eq(TL)}$$

Where:

Eq	:	Match Equity
D	:	Drop
TL	:	Take and lose the current game
TW	:	Take and win the current game
P_t	:	Take Point probability

If we introduce the Risk R defined as the difference between in match equity for “drop a doubling” and “take and Lose” and Gain G as the difference between “take and win” and “drop” one gets:

$$P_t > \frac{Eq(D) - Eq(TL)}{Eq(TW) - Eq(TL) + Eq(D) - Eq(D)}$$

$$P_t > \frac{Eq(D) - Eq(TL)}{Eq(D) - Eq(TL) + Eq(TW) - Eq(D)}$$

$$P_t > \frac{R}{R + G}$$

Where

R = Eq(D) – Eq(TL) = Risk
G=Eq(TW) – Eq(D) = Gain

Example

One example is shown below:
A match is played to 17 and at the score 11-13 the leader doubles:

The three different outcomes and score after the decision of the Trailer are:

Drop :	11 – 14
Take/Lose:	11 – 15
Take/Win:	13 – 13

The equity for these 3 scores can be found in a Match Equity Table and they are:

Eq (11-14 to 17) =	Eq(6-away ; 3-away)= 28.8%
Eq (11-15 to 17) =	Eq(6-away ; 2-away)= 20.1%
Eq(13-13 to 17) =	Eq(4-away ; 4-away) = 50.0%

The calcultated Risk and Gain are as follows:

Risk	= 28.8% - 20.1%= 8.7%
Gain	= 50.0% - 28.8%= 21.2%

So the takepoint for trailing 11-13 to 17 is then:

$P_t = \frac{8.7}{8.7+21.2} = 29.1\%$