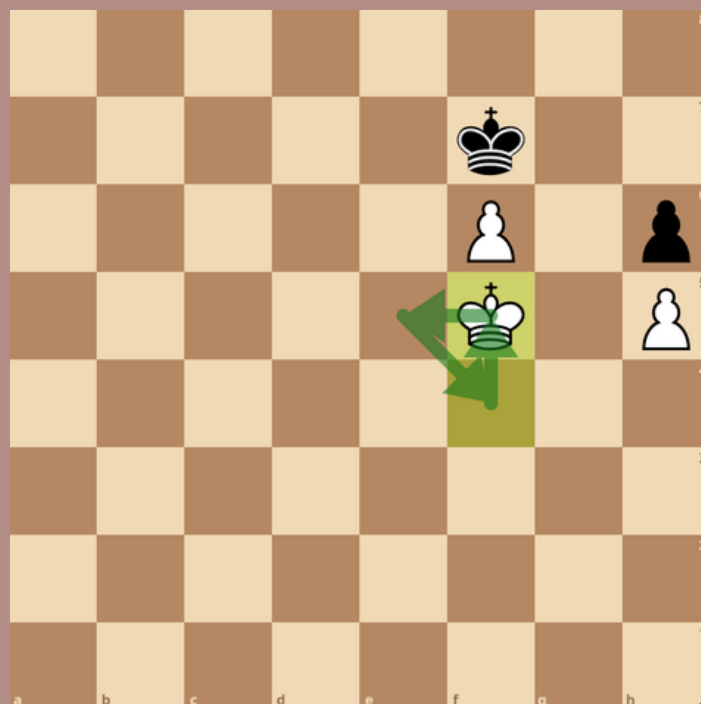


Triangulation

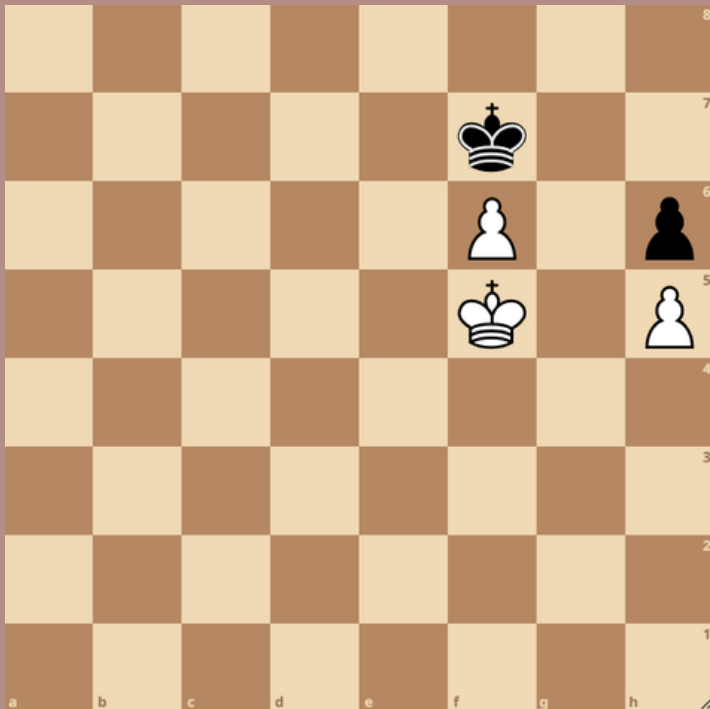
Authored by
Temporary_Coffee

Please ensure you have mastered the lesson “Opposition” (intermediate level) before learning this one, as this lesson assumes you already have a solid grasp of opposition.

Triangulation is technique that builds off of opposition, and allows you to win certain king-and-pawn endgames that would otherwise be unwinnable.



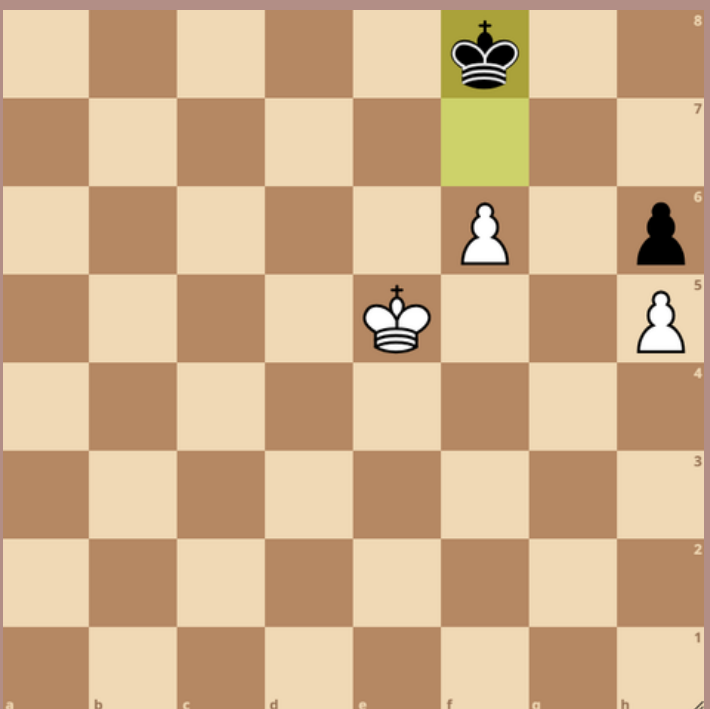
Triangulation utilizes geometry, and entails moving your king in a certain pattern to eventually pass on the turn to the opponent's king. The end result is that the board looks exactly the same, except it is the opponent's turn to move instead of yours. Triangulation is a way to gain opposition.



Let's first establish a fact. If it was black to move, this game is easy to win, (Kf8 Kg6 Kg8 Kxh6 Kf7 Kg5 Kf8 Kg6 Kg8 f7+ Kf8 h6 Ke7 Kg7 Kd6 f8=Q+) since white merely takes the h6 pawn. However, this position is white to move. Thus, we can establish a goal. If we can

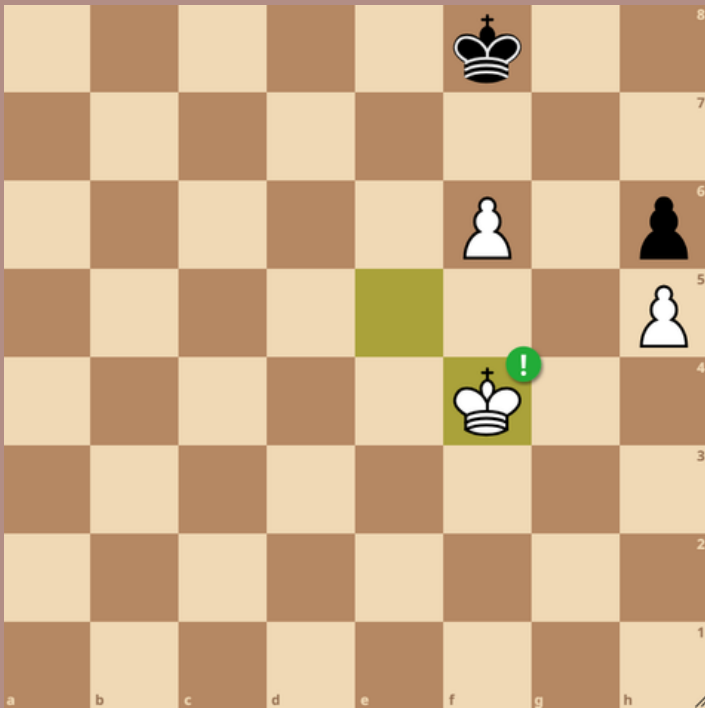
reach this same position except with black to move, we will win the game. The next step is determining how to achieve this goal. Shuffling white's king between e5 and f5 will merely result in black shuffling their king between f8 and f7. Instead, white must utilize the fact that a triangle has three points while a line segment has only two.

1. Ke5 Kf8



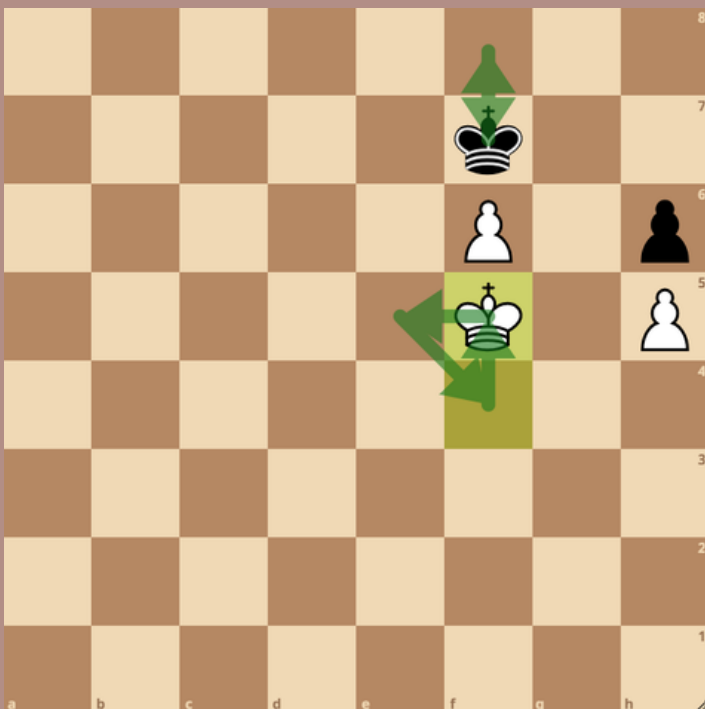
At first, white merely shuffles the king.

2. Kf4 ...



This is the crucial move. Notice that white has gained opposition, since the kings are three squares away.

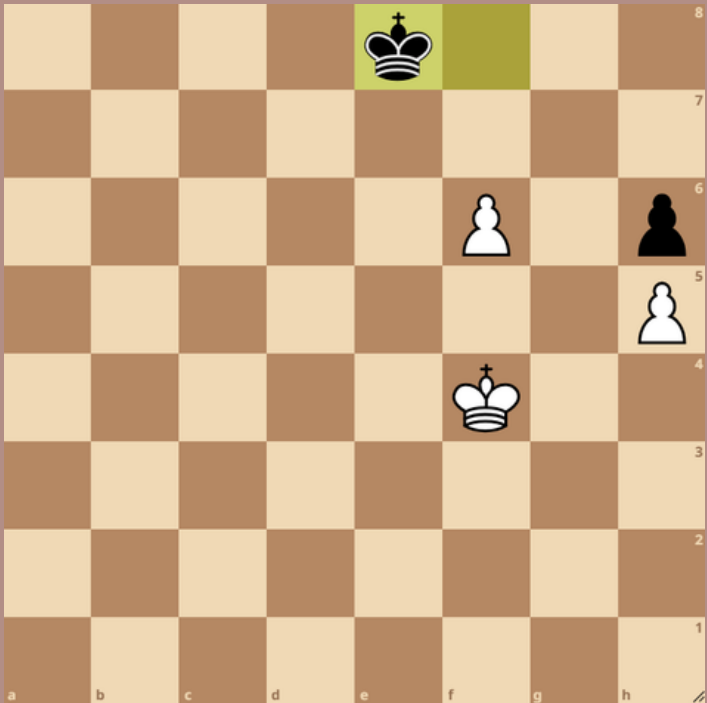
2. ... Kf7
3. Kf5 ...



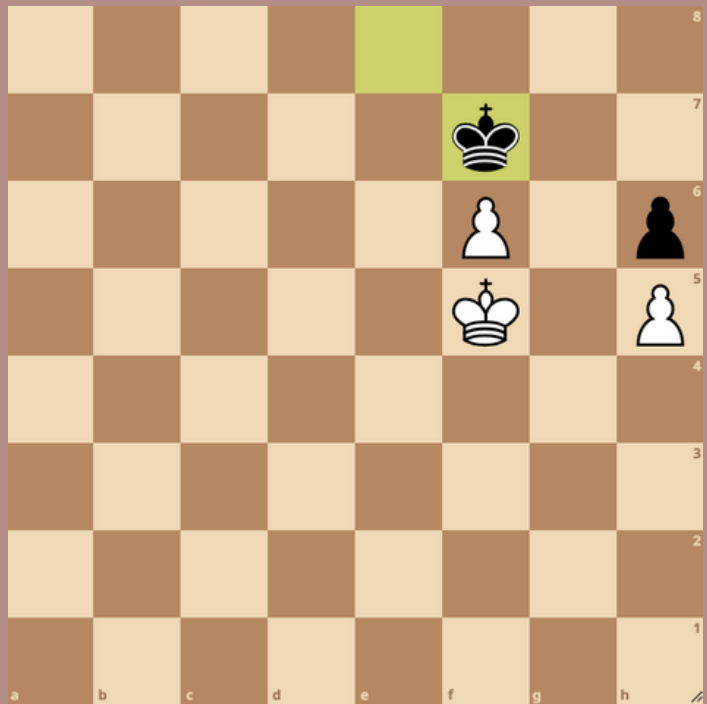
Just like that, white has achieved the set goal. The same position has been reached, but with black to move. White has opposition. Notice the triangle white's king has traveled in. This is why this idea is called triangulation. White now wins.

Here’s a question: What if black also triangulates? Observe below.

2. ... Ke8



3. Kf5 Kf7

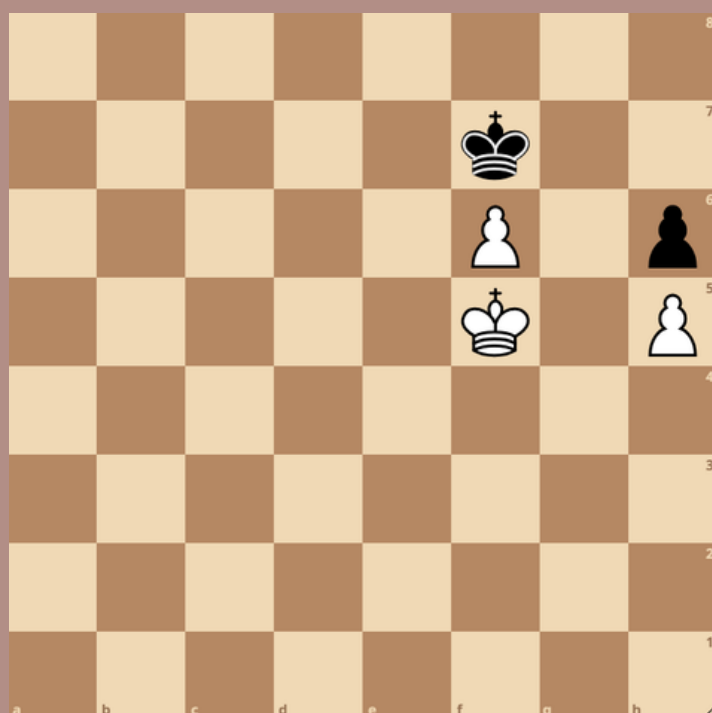


As we can see, we have reached the target position, but the move order has not changed, meaning no progress has been made. **In cases when the opponent's king can also triangulate, textbook triangulation will not work.** Let's address two questions you might have after reading this:

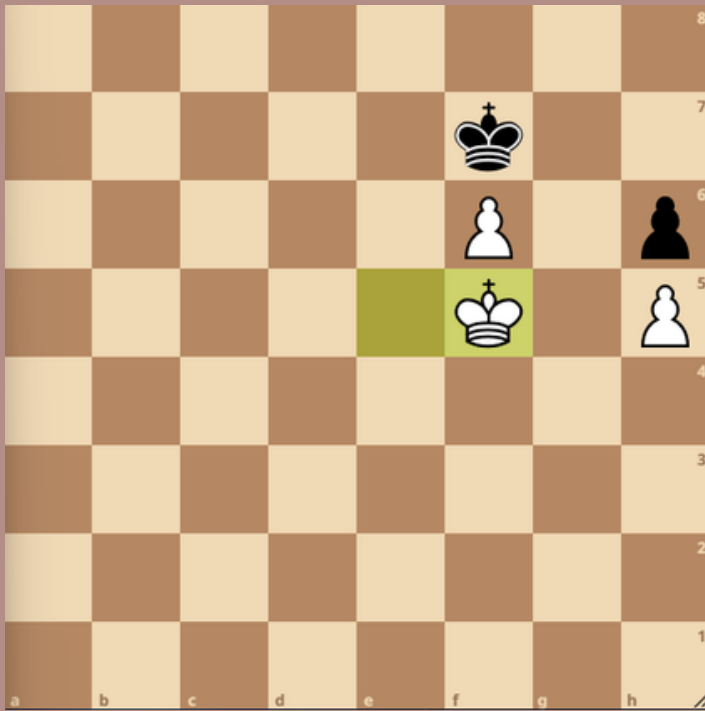
1. If triangulation doesn't work when the opponent's king can also triangulate, why did I show you the earlier position?
2. What does "textbook" triangulation mean?

The answer to question one is pretty straightforward: It was a simple position that demonstrated the concept of triangulation. That position is still winning for white, but the game won't be won using triangulation.

The answer to question two is a more nuanced. We'll use this starting position as an example.



1. Ke5 Kf8
2. Ke4 Ke8
3. Kf4 Kf8
4. Ke5 Kf7
5. Kf5 ...

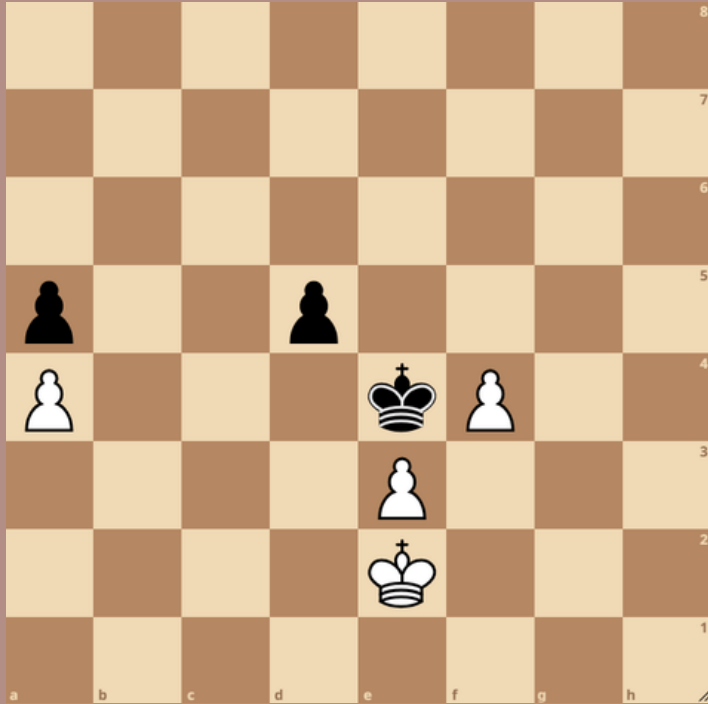


Instead of a simple triangulation maneuver, these five moves are the path to victory. However, it elements of triangulation can still be seen. Take a look at the path of the white king.



The white king moved first to e5, then e4, f4, e5, and f5. A triangle can be seen in the white king's path. This explains the use of the word "textbook" triangulation. Some positions may require additional creativity with triangulation and opposition to solve.

Now that we've seen the concept of triangulation, let's do a position where the opponent's king cannot copy your triangulation. White to move. Notice that if it was black to move this position would be significantly easier.

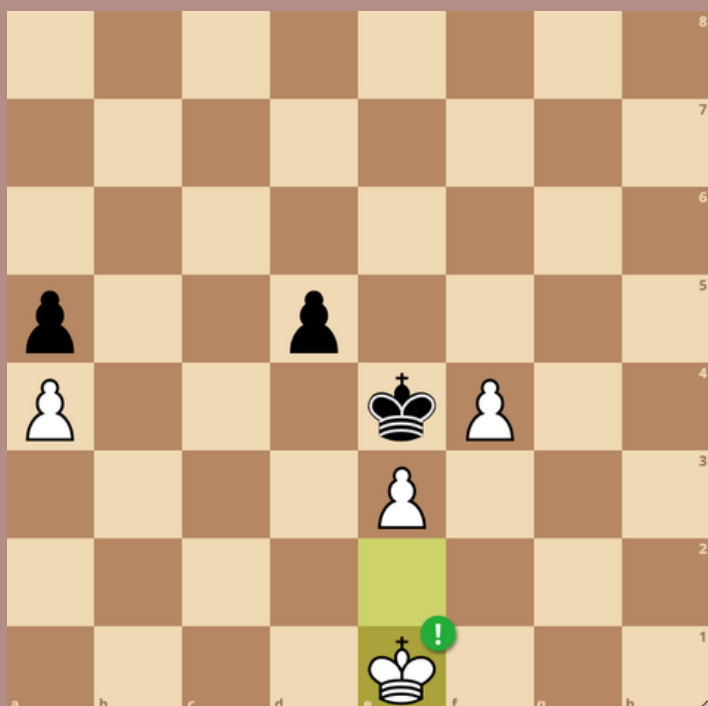


If Kf5: Kd3 Ke6 Kd4 Kd6 f5 and white wins the pawn.

If d4: exd4 and white's king protects whichever pawn black doesn't capture.

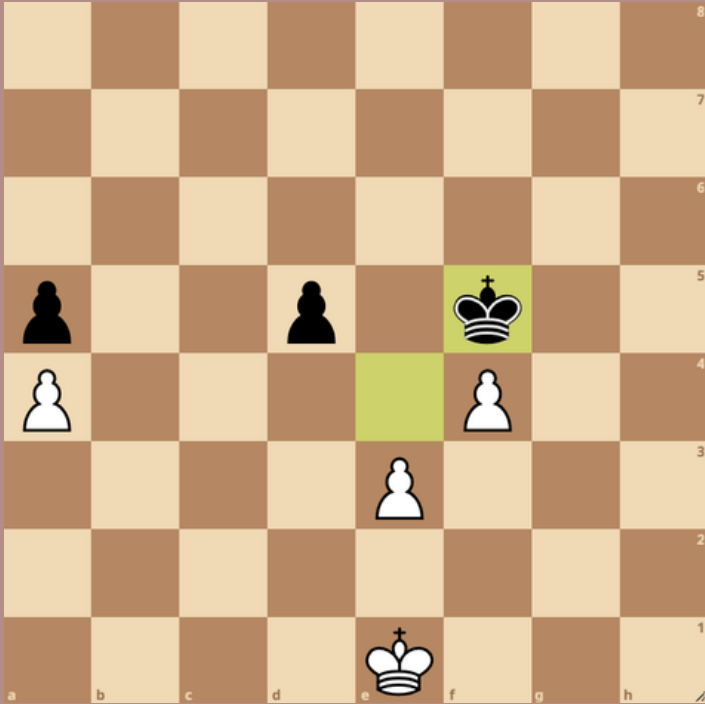
Thus, if white can reach this position with black to move, the game is won.

1. Ke1! ...



Ke1! is the only winning move in this position. Notice black has only two moves in this position: d4 and Kf5. d4 loses because white's king has enough time to protect whichever pawn black doesn't capture.

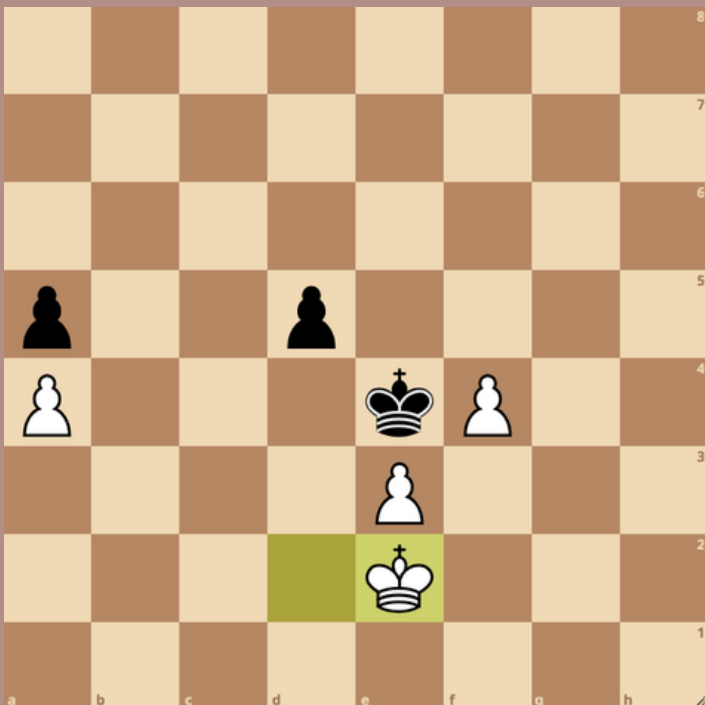
1. ... Kf5



From this position, white can freely triangulate.

2. Kd2 Ke4

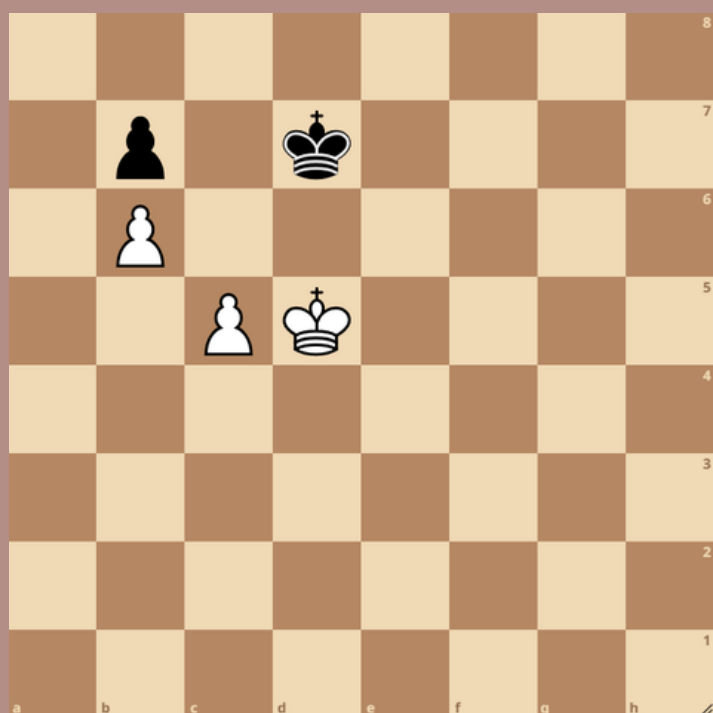
3. Ke2 ...



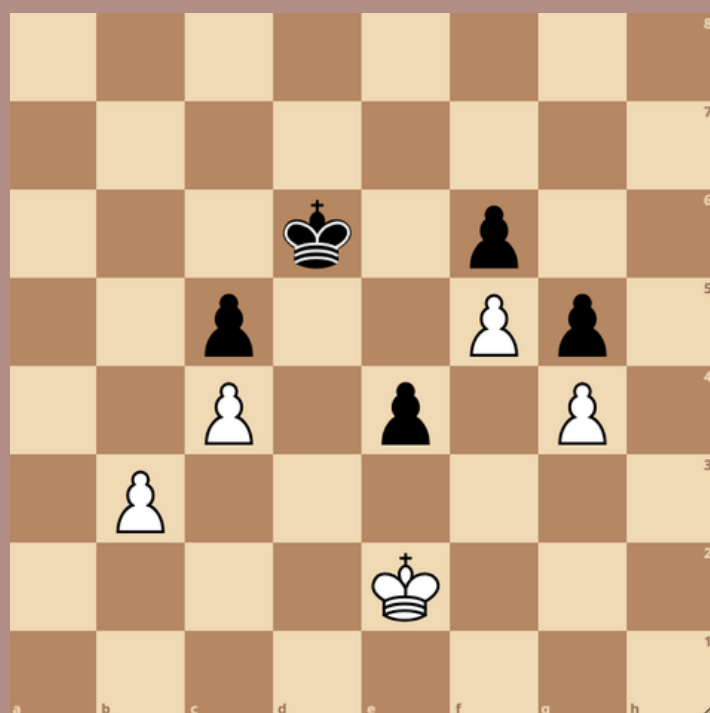
Having achieved the initial goal, white should win. Black could not triangulate since only two squares were viable – e4 and f5.

That's the essence of triangulation! It's not very common to see, but it's incredibly powerful. Like opposition, it's easy to understand, but hard to actually put into practice. Try it for yourself! Below are practice positions. Solutions are on the next page.

1



2



Problem 1

1. Ke5 (potential solution, many other moves are also winning)

If 1. ... Kc6, 2. Kd4 Kd7, 3. Kd5

If 1. ... Ke7, 2. c6

If 1. ... Ke8, 2. Kd6 Kd8, 3. Ke6 Kc8, 4. Ke7 Kb8, 5. Kd8 Ka8, 6. c6 bxc6, 7. Kc7 c5, 8. b7+ Ka7, 13. b8=Q+

Problem 2

1. Kf2 (the other winning move is Kd2)

If 1. ... Ke5, 2. Ke3 Kd6, 3. Qxe4

If 1. ... e3+, 2. Qe2 Ke5, 3. Qxe3 Kd6, 4. Ke4