Introduction

1. The "Alhazen's Problem"

Al-Mu'taman's Simplified Lemmas for Solving

FROM BAGDAD TO BARCELONA

Studies in the Islamic Exact Sciences in Honour of Prof. Juan Vernet

Barcelona 1996

Instituto Millàs Vallicrosa de Historia de la Ciencia Arabe
Anuario de Filología (Universidad de Barcelona) XIX (1996) B-2

SEPARATA

Juan P. Hodge

From Baghdad to Barcelona

Studies in the Islamic Exact Sciences in Honour of Prof. Juan Vernet
of book III of books XVIII of the OPUS no somnolentam differentiam
form


versus the medieval Latin translation made in the 17th or 18th century
in the western Latin world, there are two texts of the opus:


study the work and note the French—English version, at the end of the Infranold Commentaries (see [17] vol.
study the work and note the French—English version, at the end of the Infranold Commentaries (see [17] vol.

3. Al-Mi'lim's simplified forms of interest in history for the

3. Al-Mi'lim's simplified forms of interest in history for the

have been thoroughly investigated in the modern literature.

have been thoroughly investigated in the modern literature.

The question is almost impossible to answer.

The question is almost impossible to answer.

I. The lemmas are extremely difficult, and no other

I. The lemmas are extremely difficult, and no other

interested for several reasons:

interested for several reasons:

Al-Mi'lim's simplified forms of interest in history for the

Al-Mi'lim's simplified forms of interest in history for the

and which survives in the medieval Latin translation printed in

and which survives in the medieval Latin translation printed in

Hàyamans's very complicated work.

Hàyamans's very complicated work.

these simplifications and illustrations will be discussed in detail in chapter 10.

these simplifications and illustrations will be discussed in detail in chapter 10.

Al-Mi'lim solves the same problems as Al-Hàyamans, but

Al-Mi'lim solves the same problems as Al-Hàyamans, but

Reference [16]

Reference [16]

Proposition 311.1' and 311.2 are what and translated into section 5 and 6

Proposition 311.1' and 311.2 are what and translated into section 5 and 6

of this work into

of this work into
the same time.

notice that if \( \text{a-Hypotenuse Lemma I} \) holds, then \( D \) is outside the circle. Consider \( D \) as a point on the circle and apply \( \text{a-Hypotenuse Lemma I} \) with the circle as the circumcircle of the triangle. Then, \( D \) lies on the circle.

If \( D \) is not on the circle, then \( \text{a-Hypotenuse Lemma I} \) does not hold. Therefore, \( D \) must be on the circle.

In conclusion, \( \text{a-Hypotenuse Lemma I} \) is true if \( D \) is on the circle and false if \( D \) is not on the circle.
Let \( \alpha \) be the eye, and \( \beta \) the object (or \( \beta \) the eye and \( \alpha \) the object).

A case of a convex circular mirror (Huygens' A 1759, pp. 158-161).

In the following problem, which one might call the "Lemma of Huygens", one is given an object \( \alpha \) and an image \( \beta \) in the mirror, and inside the circle (Figure 2) in Physics A 39 (1), p. 160-161).

Similarly, Lemma VI (11.13) (Figure 1), compare Physics A 7 (3) extended and AG extended (Figure 1), compare Physics A 7 (3), p. 199-199. Similarly, Lemma VI (11.13) can be used to solve the problem of drawing the line from \( \alpha \) to \( \beta \) through the point where the mirror is convex and points \( \alpha \) and \( \beta \) are of attraction for the case of a convex circular mirror (Figure 2).

Figure 3 can be used to solve the problem of drawing a line from \( \alpha \) to \( \beta \) through the point where the mirror is convex and points \( \alpha \) and \( \beta \) are of attraction for the case of a convex circular mirror (Figure 2).

Figure 4: One of the cases of Lemma III (Figure 3). In order to explain the use of a second case of Lemma III (Figure 3).

Let \( \alpha \) be the eye, and \( \beta \) the object (or \( \beta \) the eye and \( \alpha \) the object).

Figure 5: One of the cases of Lemma III (Figure 3). In order to explain the use of a second case of Lemma III (Figure 3).

Some of the Lemmas are used in other Lemmas. This Lemma I is likely that an-Mm Lemma has the same reason for including it.

2. The Lemmas and the lost "second genus" of the Ptolemaic.
Above, the constructed the desired reflection point. O
such a way that the tangent at B passes through H. Then he finds, by Lemma 37.2, the point on the circle in
the proposition (V, 29-39) when the reflectionplane is parallel to the plane of A through the vertex P, and the line of
reflection parallel to the line of A. Suppose that O is the reflected point, and that the line of symmetry is parallel to O,
and that the plane containing O contains the line of symmetry. If the circle is in plane O, the line of symmetry is in plane 4.
In Figure 4, in modern terms, the problem of finding the

Above, he constructed the desired reflection point. O
such a way that the tangent at B passes through H. Then he finds, by Lemma 37.2, the point on the circle in
the proposition (V, 29-39) when the reflectionplane is parallel to the plane of A through the vertex P, and the line of
reflection parallel to the line of A. Suppose that O is the reflected point, and that the line of symmetry is parallel to O,
and that the plane containing O contains the line of symmetry. If the circle is in plane O, the line of symmetry is in plane 4.
In Figure 4, in modern terms, the problem of finding the

Above, he constructed the desired reflection point. O
such a way that the tangent at B passes through H. Then he finds, by Lemma 37.2, the point on the circle in
the proposition (V, 29-39) when the reflectionplane is parallel to the plane of A through the vertex P, and the line of
reflection parallel to the line of A. Suppose that O is the reflected point, and that the line of symmetry is parallel to O,
and that the plane containing O contains the line of symmetry. If the circle is in plane O, the line of symmetry is in plane 4.
In Figure 4, in modern terms, the problem of finding the

Above, he constructed the desired reflection point. O
such a way that the tangent at B passes through H. Then he finds, by Lemma 37.2, the point on the circle in
the proposition (V, 29-39) when the reflectionplane is parallel to the plane of A through the vertex P, and the line of
reflection parallel to the line of A. Suppose that O is the reflected point, and that the line of symmetry is parallel to O,
and that the plane containing O contains the line of symmetry. If the circle is in plane O, the line of symmetry is in plane 4.
In Figure 4, in modern terms, the problem of finding the

Above, he constructed the desired reflection point. O
such a way that the tangent at B passes through H. Then he finds, by Lemma 37.2, the point on the circle in
the proposition (V, 29-39) when the reflectionplane is parallel to the plane of A through the vertex P, and the line of
reflection parallel to the line of A. Suppose that O is the reflected point, and that the line of symmetry is parallel to O,
and that the plane containing O contains the line of symmetry. If the circle is in plane O, the line of symmetry is in plane 4.
In Figure 4, in modern terms, the problem of finding the

Above, he constructed the desired reflection point. O
such a way that the tangent at B passes through H. Then he finds, by Lemma 37.2, the point on the circle in
the proposition (V, 29-39) when the reflectionplane is parallel to the plane of A through the vertex P, and the line of
reflection parallel to the line of A. Suppose that O is the reflected point, and that the line of symmetry is parallel to O,
and that the plane containing O contains the line of symmetry. If the circle is in plane O, the line of symmetry is in plane 4.
In Figure 4, in modern terms, the problem of finding the

Above, he constructed the desired reflection point. O
such a way that the tangent at B passes through H. Then he finds, by Lemma 37.2, the point on the circle in
the proposition (V, 29-39) when the reflectionplane is parallel to the plane of A through the vertex P, and the line of
reflection parallel to the line of A. Suppose that O is the reflected point, and that the line of symmetry is parallel to O,
and that the plane containing O contains the line of symmetry. If the circle is in plane O, the line of symmetry is in plane 4.
In Figure 4, in modern terms, the problem of finding the

Above, he constructed the desired reflection point. O
such a way that the tangent at B passes through H. Then he finds, by Lemma 37.2, the point on the circle in
the proposition (V, 29-39) when the reflectionplane is parallel to the plane of A through the vertex P, and the line of
reflection parallel to the line of A. Suppose that O is the reflected point, and that the line of symmetry is parallel to O,
and that the plane containing O contains the line of symmetry. If the circle is in plane O, the line of symmetry is in plane 4.
In Figure 4, in modern terms, the problem of finding the

Above, he constructed the desired reflection point. O
such a way that the tangent at B passes through H. Then he finds, by Lemma 37.2, the point on the circle in
the proposition (V, 29-39) when the reflectionplane is parallel to the plane of A through the vertex P, and the line of
reflection parallel to the line of A. Suppose that O is the reflected point, and that the line of symmetry is parallel to O,
and that the plane containing O contains the line of symmetry. If the circle is in plane O, the line of symmetry is in plane 4.
In Figure 4, in modern terms, the problem of finding the

Above, he constructed the desired reflection point. O
such a way that the tangent at B passes through H. Then he finds, by Lemma 37.2, the point on the circle in
the proposition (V, 29-39) when the reflectionplane is parallel to the plane of A through the vertex P, and the line of
reflection parallel to the line of A. Suppose that O is the reflected point, and that the line of symmetry is parallel to O,
and that the plane containing O contains the line of symmetry. If the circle is in plane O, the line of symmetry is in plane 4.
In Figure 4, in modern terms, the problem of finding the

Above, he constructed the desired reflection point. O
such a way that the tangent at B passes through H. Then he finds, by Lemma 37.2, the point on the circle in
the proposition (V, 29-39) when the reflectionplane is parallel to the plane of A through the vertex P, and the line of
reflection parallel to the line of A. Suppose that O is the reflected point, and that the line of symmetry is parallel to O,
and that the plane containing O contains the line of symmetry. If the circle is in plane O, the line of symmetry is in plane 4.
In Figure 4, in modern terms, the problem of finding the

Above, he constructed the desired reflection point. O
such a way that the tangent at B passes through H. Then he finds, by Lemma 37.2, the point on the circle in
the proposition (V, 29-39) when the reflectionplane is parallel to the plane of A through the vertex P, and the line of
reflection parallel to the line of A. Suppose that O is the reflected point, and that the line of symmetry is parallel to O,
and that the plane containing O contains the line of symmetry. If the circle is in plane O, the line of symmetry is in plane 4.
In Figure 4, in modern terms, the problem of finding the

Above, he constructed the desired reflection point. O
such a way that the tangent at B passes through H. Then he finds, by Lemma 37.2, the point on the circle in
the proposition (V, 29-39) when the reflectionplane is parallel to the plane of A through the vertex P, and the line of
reflection parallel to the line of A. Suppose that O is the reflected point, and that the line of symmetry is parallel to O,
Since A.M. Liouville simplified the Huygens' lemmas rather

**Figure 1**

![Diagram of geometric optics]

The question then arises as to whether it was also able to simplify
directly. The question then arises as whether he was also able to simplify

**Figure 2**

![Diagram of geometric optics]

the problem of Huygens' lemmas. Note that theHOLDER of A.M. Liouville (1823) calls
the problem of Huygens' lemmas in the same plane as the mirror (Figure 2). Of course, it is likely that

**Figure 3**

![Diagram of geometric optics]

cases of the problem of Huygens for a circular mirror and eye and object
cases of the problem of Huygens for a circular mirror and some of the
convergent convex mirrors along the lines of optics. It is to be hoped that

**Figure 4**

![Diagram of geometric optics]

the construction of the

Lemmas A and V I are only used in the construction of the

[@HOGENDUK 89, p. 206]

*AL-MU'AMAMA'S SIMPLIFIED LEMMAS FOR SOLVING 'AL-HAYYAM'S PROBLEM*
1. And knowing, it is the problem of Proposition

2. 1 If $B$, we want to draw from it a line such that its ratio of the part
3. of line $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point
4. the reasoning which is in an assumption form. Thus, the reasoning be
5. the same, it is of $A$ (except $B$, if $B$, except 2) and (except 3) point

6. California, 1971. If there is an assumed right-angle triangle,
7. and $C$, then $D$, as in the introduction, its introduction. But

8. the triangle is that the whole of the part (the part (the part) of the
9. and $B$, then $A$, except $B$, if $B$, except 2) and (except 3) point.

10. in the only recognizable work where $A$ and $B$ are on the same side of the
11. and $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point

12. where $A$ in the introduction, its introduction. But

13. the only recognizable work where $A$ and $B$ are on the same side of the
14. and $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point.

15. in the only recognizable work where $A$ and $B$ are on the same side of the
16. and $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point.

17. where $A$ in the introduction, its introduction. But

18. the only recognizable work where $A$ and $B$ are on the same side of the
19. and $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point.

20. in the only recognizable work where $A$ and $B$ are on the same side of the
11. and $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point.

21. where $A$ in the introduction, its introduction. But

22. the only recognizable work where $A$ and $B$ are on the same side of the
11. and $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point.

23. in the only recognizable work where $A$ and $B$ are on the same side of the
11. and $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point.

24. where $A$ in the introduction, its introduction. But

25. the only recognizable work where $A$ and $B$ are on the same side of the
11. and $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point.

26. in the only recognizable work where $A$ and $B$ are on the same side of the
11. and $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point.

27. where $A$ in the introduction, its introduction. But

28. the only recognizable work where $A$ and $B$ are on the same side of the
11. and $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point.

29. in the only recognizable work where $A$ and $B$ are on the same side of the
11. and $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point.

30. where $A$ in the introduction, its introduction. But

31. the only recognizable work where $A$ and $B$ are on the same side of the
11. and $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point.

32. in the only recognizable work where $A$ and $B$ are on the same side of the
11. and $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point.

33. where $A$ in the introduction, its introduction. But

34. the only recognizable work where $A$ and $B$ are on the same side of the
11. and $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point.

35. in the only recognizable work where $A$ and $B$ are on the same side of the
11. and $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point.

36. where $A$ in the introduction, its introduction. But

37. the only recognizable work where $A$ and $B$ are on the same side of the
11. and $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point.

38. in the only recognizable work where $A$ and $B$ are on the same side of the
11. and $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point.

39. where $A$ in the introduction, its introduction. But

40. the only recognizable work where $A$ and $B$ are on the same side of the
11. and $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point.

41. in the only recognizable work where $A$ and $B$ are on the same side of the
11. and $B$, we define $A$ (except $B$, if $B$, except 2) and (except 3) point.

42. where $A$ in the introduction, its introduction. But
two points which may be unknown.

2. Points A and B are known.

4. The combination of (1) and (2).

To find the coordinates of the center of gravity of a rigid body, we need to know the coordinates of the points where the body is supported.

A and B are known points, but the coordinates of C and D are unknown.
The diagram should be inserted here to illustrate the construction.

Figure 5.12

Analyzing, we assume that line (line) already exists. Let us be the

The construction is explained in Figure 5.12. From point $O$, draw line $OF$ parallel to the assumed lines $FG$, $FH$, which means $OF$ at point $T$ and the $AV$ at point $G$ (we assume $EF$).

We then draw from point $E$ the $EF$ parallel to the $GF$ and $FH$.

Symbol $H$ is the point on the $EF$ parallel to the $GF$. We construct on point $G$ a hyperbola with asymptotes $EF$. Thus, if we subtract the $LH$ which is equal to the $CH$, the $CH$ is proved to exist. The magnitude in question is to be dealt with in $LH$.
Thus let us join $AB$. $AC$ we draw from points $B$, $G$ two lines.

F/Z. 7. $BF = AZ$ because $BF$ is parallel to $GZ$.

Figure 37.3

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

By Corollary 114 (cf. Footnote to p. 312).

Indeed $A_2$, $5$, p. 276, I.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.

The points $H$, $E$, $Z$, $T$, $L$, and $N$ occur twice in the figure.
THE PROPOSITION is essentially the same as the above. For example, we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]

we have

\[ \text{Proposition \ III} \]
**KCH:** The path is what we want to prove.

Because of the previous steps, \( \triangle ADT \cong \triangle HTM \) in a consequence of the similarity of triangles \( \triangle KMB \). Let's use the modern terminology of the similarity of triangles \( \triangle ADT \) and \( \triangle HTM \).

**KCH:** The path in which the distance is the same (the assumed point is the same as the same). Note the path for the same. \( \triangle ADT \) and \( \triangle HTM \) are similar, and in the same way, triangles \( \triangle KMB \) and \( \triangle HKD \) are equal to angles \( \triangle ADT \) and \( \triangle HKD \) are equal to angles at point \( F \).

**Figure 51.4**

![Diagram of geometric proof](image-url)
In the figure, note that there is no figure for the case where points $E$ and $H$ are outside the

**Figure 51/5a**

**Prove:**

In any triangle $ABC$, if $AD$ is an altitude from $A$ to $BC$, then $AD$ is the shortest altitude from $A$ to $BC$. This follows from the fact that the altitude is the shortest distance from a point to a line. Therefore, $AD$ is the shortest altitude from $A$ to $BC$.

**Theorem:**

In a triangle $ABC$, if $AD$ is an altitude from $A$ to $BC$, then $AD$ is the shortest altitude from $A$ to $BC$. This follows from the fact that the altitude is the shortest distance from a point to a line. Therefore, $AD$ is the shortest altitude from $A$ to $BC$.

**Proof:**

In any triangle $ABC$, if $AD$ is an altitude from $A$ to $BC$, then $AD$ is the shortest altitude from $A$ to $BC$. This follows from the fact that the altitude is the shortest distance from a point to a line. Therefore, $AD$ is the shortest altitude from $A$ to $BC$.

**Corollary:**

In a triangle $ABC$, if $AD$ is an altitude from $A$ to $BC$, then $AD$ is the shortest altitude from $A$ to $BC$. This follows from the fact that the altitude is the shortest distance from a point to a line. Therefore, $AD$ is the shortest altitude from $A$ to $BC$.

**Example:**

In any triangle $ABC$, if $AD$ is an altitude from $A$ to $BC$, then $AD$ is the shortest altitude from $A$ to $BC$. This follows from the fact that the altitude is the shortest distance from a point to a line. Therefore, $AD$ is the shortest altitude from $A$ to $BC$.
The proposition is essentially the same as in the problem, 
Graves' Theorem, that if a straight line cuts the circumference of a circle, 
and one of its points is at the circumference, 
the other point

\[ \text{Figure 31.6} \]

In such a way that the part of the line between the points is equal to the part of the line between the points.

\[ \text{Figure 31.5} \]
In modern terms, the concepts of EAZC and EON are similar.

Theorem 3 (Similarity): The ratio of the lengths of two corresponding sides of two similar triangles is equal.

This theorem states that if two triangles are similar, the ratio of their corresponding side lengths is constant. This is a fundamental concept in geometry, used in various applications, including scale drawings and engineering calculations.

Proof by Similarity of Triangles:

1. Given two similar triangles, ABC and DEF, with corresponding vertices A and D, B and E, C and F.
2. The ratio of any two corresponding sides is equal, i.e., AB/DE = BC/EF = AC/DF.
3. This equality holds because the triangles are similar, and their corresponding sides are proportional.

The proof involves establishing the similarity of the triangles first, and then using the properties of similar triangles to show that the ratios of corresponding sides are equal.

J.P. HOCENDUK
we wanted to prove

The ratio of AK to KT, which is equal to the ratio of GK to KB. That is what
the ratio of AV to TD, which is equal to the assumed ratio of TG. That is what
are equal. Therefore, AK, DK, and angle DKB are similar to triangles XTB. XTH. Thus
the ratio of AV to TD, which is equal to the angle DKB, is equal to the angle DTB, and angle DKB
is equal to the angle DEB, which is equal to the angle DKB. That is what
is equal to the ratio of GK to KB is the assumed ratio.

![Diagram](image.png)

**Figure 5.1.**
(4) यदि हमें ठीक ऐतिहासिक वर्णालापों का निर्देश नहीं मिलता, तो हमें आपके नाम पर उपयोग करने के लिए निर्देश देने के लिए आवश्यक है।

(5) हमें यहां एक निष्क्रिय रूप से आपके नाम पर उपयोग करने के लिए आवश्यक है।

(6) हमें यहां एक निष्क्रिय रूप से आपके नाम पर उपयोग करने के लिए आवश्यक है।