

58. State the converse of the second case of Euc. i. 26? Under what limitations is it true? Prove the proposition so limited?
59. Shew that the angle contained between the perpendiculars drawn to two given straight lines which meet each other, is equal to the angle contained by the lines themselves.
60. Are two triangles necessarily equal in all respects, where a side and two angles of the one are equal to a side and two angles of the other, each to each?
61. Illustrate fully the difference between analytical and synthetical proofs. What propositions in Euclid are demonstrated analytically?
62. Can it be properly predicated of any two straight lines that they never meet if indefinitely produced either way, antecedently to our knowledge of some other property of such lines, which makes the property first predicated of them a necessary conclusion from it?
63. Enunciate Euclid's definition and axiom relating to parallel straight lines; and state in what Props. of Book i. they are used.
64. What proposition is the converse to the twelfth axiom of the First Book? What other two propositions are complementary to these?
65. If lines being produced ever so far do not meet; can they be otherwise than parallel? If so, under what circumstances?
66. Define *adjacent angles*, *opposite angles*, *vertical angles*, and *alternate angles*; and give examples from the First Book of Euclid.
67. Can you suggest anything to justify the assumption in the twelfth axiom upon which the proof of Euc. i. 29, depends?
68. What objections have been urged against the definition and the doctrine of parallel straight lines as laid down by Euclid? Where does the difficulty originate? What other assumptions have been suggested and for what reasons?
69. Assuming as an axiom that two straight lines which cut one another cannot both be parallel to the same straight line; deduce Euclid's twelfth axiom as a corollary of Euc. i. 29.
70. From Euc. i. 27, shew that the distance between two parallel straight lines is constant?
71. If two straight lines be not parallel, shew that all straight lines falling on them, make alternate angles, which differ by the same angle.
72. Taking as the definition of parallel straight lines that they are equally inclined to the same straight line towards the same parts; prove that "being produced ever so far both ways they do not meet?" Prove also Euclid's axiom 12, by means of the same definition.
73. What is meant by *exterior* and *interior* angles? Point out examples.
74. Can the three angles of a triangle be proved equal to two right angles without producing a side of the triangle?
75. Shew how the corners of a triangular piece of paper may be turned down, so as to exhibit to the eye that the three angles of a triangle are equal to two right angles.
76. Explain the meaning of the term *corollary*. Enunciate the two corollaries appended to Euc. i. 32, and give another proof of the first. What other corollaries may be deduced from this proposition?
77. Shew that the two lines which bisect the exterior and interior angles of a triangle, as well as those which bisect any two interior angles of a parallelogram, contain a right angle.
78. The opposite sides and angles of a parallelogram are equal to one another, and the diameters bisect it. State and prove the converse of this proposition. Also shew that a quadrilateral figure, is a paral-