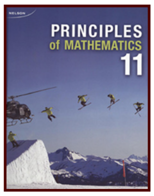
Question 15, p. 102

The angles indicated are external angles for the pentagon in the middle of the figure. The sum of exterior angles of a polygon is 360°.

Lesson 4.3: Congruent Triangles



Refer to *Principles of Mathematics 11* pages 106 and 113 for more examples.

- Page 106, #1b, 2, 3b, and 3c
- Page 113, #2b, 6, 7, 9, 11, and 14

Question 1b, p. 106

b. The two are congruent by the AAS congruence.

Question 2, p. 106

a. Yes, the two are congruent by the AAS congruence.
b. No, AAA is not a congruence relationship.

Question 3b and c, p. 106

b. $FH = JK$, $\angle H = \angle K$, and $GH = LK$ so $\Delta GHF \cong \Delta LKJ$ by SAS.

c. $AC = BU$, $CR = BS$, and $AR = US$ so $\Delta ACR \cong \Delta UBS$ by SSS.

Question 2b, p. 113

b. $\angle PYO = \angle NYO$, $YO = YO$, and $\angle POY = \angle NOY$ so $\Delta POY = \Delta NOY$ by ASA.

Question 6, p. 113

Proofs may vary, a sample is shown.

Statement	Justification
$\angle XWY = \angle ZWY$	Definition of a bisector.
$\angle XYW = \angle ZYW$	Definition of a bisector.
$WY = WY$	Same line segment.
$\Delta WXY = \Delta WZY$	ASA
$XY = ZY$	They are corresponding sides of congruent triangles.

Question 7, p. 113

Proofs may vary, a sample is shown.

Statement	Justification
$\angle PRQ = \angle PSQ$	Given.
ΔPRS is isosceles	It contains two equal angles.
$PR = PS$	They are sides opposite equal angles in an isosceles triangle.
$QR = QS$	Q is the midpoint of RS (given).
$\Delta PRQ \cong \Delta PSQ$	SAS
$\angle PQR = \angle PQS$	They are corresponding angles of congruent triangles.
$\angle PQR + \angle PQS = 180^\circ$	They form a straight line.
$\angle PQR + \angle PQR = 180^\circ$	Substitution.
$\angle PQR = 90^\circ$	Solving the previous equation.
$PQ \perp RQ$	They form an angle of 90°.

Question 9, p. 114

Proofs may vary, a sample is shown.

Statement	Justification
$AB = DE$	Given.
$\angle ABC = \angle DEC$	Given.
$\angle ACB = \angle DCE$	They are opposite angles.
$\Delta ACB \cong \Delta DCE$	AAS
$BC = EC$	They are corresponding sides of congruent triangles.
ΔBCE is isosceles	It contains two equal sides.

Question 11, p. 114

$\angle ABF$ and $\angle DCE$ are not alternate interior angles. Also, AE and DF are not sides of a triangle, AF and DE should have been used.

Corrected Proof:

Statement	Justification
$AB \parallel CD$	Given.
$\angle BAF = \angle CDE$	They are alternate interior angles.
$BF \parallel CE$	Given.
$\angle BFA = \angle CED$	They are alternate interior angles.
$AE = DF$	Given.
$EF = EF$	Common line segment.
$AF = DE$	Segment addition.
$\Delta BAF = \Delta CDE$	ASA

Question 14, p. 115

Proofs may vary, a sample is shown.

Statement	Justification
$JK = JK$	Common line segment.
$HJ = LK$	Given.
$HK = LJ$	Segment addition.
$GH = ML$	Given.
$\angle GHL = \angle MLH$	Both equal 90°.
$\Delta GHK \cong \Delta MLJ$	SAS
$\angle NJK = \angle NKJ$	They are corresponding angles of congruent triangles.
ΔNJK is isosceles	It contains two equal angles.