PROOF OF CIRCLE THEOREMS

ANSWER SHEET

Q1-

Let PQO = x and RQO = y

PQO = QPO
Angles at the base of an isosceles triangle are equal

RQO = QRO
Angles at the base of an isosceles triangle are equal

POQ = 180 - 2x
Angles in a triangle add to 180°

QOR = 180 - 2y
Angles in a triangle add to 180°

PQR = x + y

POR = 360 - (180 - 2x) - (180 - 2y)
= 360 - 180 + 2x - 180 + 2y
= 2x + 2y
= 2(x + y)
= 2(PQR)

Q2-

Let OPQ = x and OQR = y

OPQ = OQP
Angles at the base of an isosceles triangle are equal

OQR = ORQ
Angles at the base of an isosceles triangle are equal

POQ = 180 - 2x
Angles in a triangle add to 180°

QOR = 180 - 2y
Angles in a triangle add to 180°

180 - 2x + 180 - 2y = 180
360 - 2x - 2y = 180
180 = 2x + 2y
90 = x + y

PQR = x + y
= 90°

Q3-

POS = x

PQS = (1/2) x
Angle at the circumference is half the angle at the centre

PRS = (1/2) x
Angle at the circumference is half the angle at the centre

PQS = PRS = (1/2) x

Q4-

Let POR (minor) = x
Let POR (major) = y

PRS = (1/2) x
The angle at the centre is twice the angle at the circumference.

PQR = (1/2) y
The angle at the centre is twice the angle at the circumference.

x + y = 360
Angles around a point add to 360°

(1/2) x + (1/2) y = 180

PQR + PRS = 180

Q5-

Let QRT = x

ORT = 90°
Tangent meets radius at 90°

ORQ = 90 - x

UQR = 90°
Angle in a semicircle is 90°

QUR = 180 - 90 - (90 - x) = x

QPR = x

Angles from the same points (in the same segment) are equal.

QPR = QRT = x