Foundation Check In - 9.02 Congruence

**Use triangle ABC to answer questions 1 and 2.**

**Not to scale**

108°

41°

A

C

B

9

7

13

1. Triangle PQR is congruent to triangle ABC. Find length PR.

**Not to scale**

108°

41°

P

R

Q

7

1. Triangle STU is congruent to triangle ABC. Find angle *u*.

S

U

T

*u*

9

7

13

**Not to scale**

3. Which of these triangles are congruent?

**Not to scale**

4

5

45°

50°

**B**

5

50°

4

45°

**A**

10

50°

8

45°

**D**

5

50°

4

45°

**C**

1. Triangles FGH and JKL are congruent. Find angle *k*.

*k*

L

K

J

25°

H

G

F

**Not to scale**

1. The lines AB and YZ are parallel in the diagram below.

Find length XZ.

X

Y

Z

B

A

9

7

9

**Not to scale**

8

1. The diagram below shows a parallelogram, ABCD. Explain why triangle ABC and triangle CDA are congruent.

A

B

**Not to scale**

C

D

7. Explain why a kite is formed from two congruent triangles.

8. Maria makes the following statement.

“If two triangles have the same base and height then their areas are the same and therefore they are congruent triangles.”

 Explain why Maria is not correct.

9. The diagram below shows two intersecting circles of equal size. Angle QPR = 40°.

Work out angle PSR.

P

S

R

Q

40°

5

**Not to scale**

10. Points A, B and C are on the circumference of a circle, centre O. OA is parallel to CB and AB is parallel to OC. Find angle ABC.

O

A

B

C

**Not to scale**

**Extension**

Given that ED is parallel to GF and DH is the same length as GH, prove that triangle EDH and triangle FGH are congruent.

D

H

G

F

E

**Not to scale**

Answers

1. 9
2. 41°
3. 31°
4. 65°
5. 7
6. 3 statements supporting SSS, SAS or ASA from the 6 statements below.

AB  DC (opposite sides of parallelogram)

BC  AD (opposite sides of parallelogram)

AC  AC (common side)

Angle BAC  Angle ACD (alternate angles)

Angle BCA  Angle CAD (alternate angles)

Angle ABC  Angle ADC (opposite angles in parallelogram)

A

B

C

D

Line AC is a line of symmetry

Length AD  Length AB

Length DC  Length BC

SSS so congruent triangles

1. The h in  is the perpendicular height and does not necessarily refer to an actual triangle side length.
2. 100°

40°

40°

100°

P

S

R

Q

40°

5

100°

40°

1. 120°

**Extension**

E = F (alternate angles because ED is parallel to GF)

EHD = GHF (vertically opposite angles)

DH = GH (equal sides, stated in the question)

So EDH and FGH are congruent (ASA – 2 angles, 1 side)

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| **Assessment Objective** | **Qu.** | **Topic** | **R** | **A** | **G** |  | **Assessment Objective** | **Qu.** | **Topic** | **R** | **A** | **G** |
| AO1 | 1 | Know that corresponding lengths in congruent triangles are equal |  |  |  |  | AO1 | 1 | Know that corresponding lengths in congruent triangles are equal |  |  |  |
| AO1 | 2 | Know that corresponding angles in congruent triangles are equal |  |  |  |  | AO1 | 2 | Know that corresponding angles in congruent triangles are equal |  |  |  |
| AO1 | 3 | Identify congruent triangles |  |  |  |  | AO1 | 3 | Identify congruent triangles |  |  |  |
| AO1 | 4 | Recognise congruence in related triangles to find an angle |  |  |  |  | AO1 | 4 | Recognise congruence in related triangles to find an angle |  |  |  |
| AO1 | 5 | Identify corresponding angles and sides of congruent triangles |  |  |  |  | AO1 | 5 | Identify corresponding angles and sides of congruent triangles |  |  |  |
| AO2 | 6 | Recognise congruence in parallelograms |  |  |  |  | AO2 | 6 | Recognise congruence in parallelograms |  |  |  |
| AO2 | 7 | Recognise congruence in kites |  |  |  |  | AO2 | 7 | Recognise congruence in kites |  |  |  |
| AO2 | 8 | Understand properties of congruent triangles |  |  |  |  | AO2 | 8 | Understand properties of congruent triangles |  |  |  |
| AO3 | 9 | Apply congruence to solve a problem |  |  |  |  | AO3 | 9 | Apply congruence to solve a problem |  |  |  |
| AO3 | 10 | Apply congruence to solve a problem |  |  |  |  | AO3 | 10 | Apply congruence to solve a problem |  |  |  |
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| AO2 | 6 | Recognise congruence in parallelograms |  |  |  |  | AO2 | 6 | Recognise congruence in parallelograms |  |  |  |
| AO2 | 7 | Recognise congruence in kites |  |  |  |  | AO2 | 7 | Recognise congruence in kites |  |  |  |
| AO2 | 8 | Understand properties of congruent triangles |  |  |  |  | AO2 | 8 | Understand properties of congruent triangles |  |  |  |
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