M1.

Alternative method 1

$\angle PCB = 180 - 90 - 15$ or $75°$
or
$\angle PCB = 90 - 15$

oe

Angle may be seen on diagram

M1

$\angle ABC = \angle PCB$ = their 75
and
$\angle BCD$ = 180 – their 75 or 105°

oe

Angles may be seen on diagram

M1

$x = 105 - 75 = 30°$

Full method required

A1

Alternative method 2

$\angle PCB = 180 - 90 - 15$ or $75°$
or
$\angle PCB = 90 - 15$

oe

Angles may be seen on diagram

M1

$\angle ABP = \angle PCB$ = their 75
and
$\angle ABP$ = their 75 – 15 or 60°
and
$\angle BAC$ = 180 – 90 – their 60

oe

Angles may be seen on diagram

M1

$x = \angle BAC = 30°$

Full method required

A1

Alternative method 3

$\angle PCB = 180 - 90 - 15$ or $75°$
or
$\angle PCB = 90 - 15$

oe

Angle may be seen on diagram

M1

$\angle ABC = \angle PCB$ = their 75
and
$\angle BAC$ = 180 – their 75 – their 75

oe

Angle may be seen on diagram

M1

$x = \angle BAC = 30°$

Full method required

A1

[3]

M2.

OR = *OP* (= 6cm or sides of same square) **or** show 6 on *OR* on diagram

Must give reason if OR not marked as 6

B1

OC = *OA* (= 8cm or sides of same square) **or** show 8 on *OA* on diagram

Must give reason if OA not marked as 8

B1

$\angle ROC = \angle AOP = 30$ with $90 - 60$ or $120 - 90$ stated or 60 shown as $\angle AOR$

B1

Congruent as SAS. Might be stated in words such as two sides and included angle.

May use cosine rule to calculate third side. Must be correct and give correct value 4.1… then SSS can be given as reason or in words 'all three sides same'.

If no reasons given penalise first omission but allow thereafter.

B1

[4]

M3.(a) 108

B1

Corresponding

strand (i)

Mark is dependent on scoring B1

Q1

(b) 180 − 117 *oe*

M1

63

A1

[4]

M4.(a) 50

B1

(b) 27

B1

(c) 180 – 90 – 58 *oe*

or 90 – 58

M1

32

A1

[4]

M5. 3 × 180 or 540 seen

Must be convinced that 360 ÷ 5 is for the exterior angle

or Exterior angle = 360 ÷ 5 or 72

May be on diagram

M1

(Interior angle =) 108

Must be convinced that 108 is for the interior angle

May be on diagram

A1

108 – 72

May be on diagram

or acute angle in rhombus = 72

180 – 72 – 72

or acute angle in rhombus = 180 – their obtuse interior angle

or (180 – 108) ÷ 2

M1

36

ft for obtuse interior angles only

A1ft

[4]

M6.(a) tan chosen

$$\frac{h}{sin35} = \frac{1.2}{sin55}$$

M1

$\tan 35 = \frac{h}{1.2}$

$\frac{1.2\sin 35}{\sin 55}$

or 1.2 tan 35

M1dep

0.84 …

Allow 0.8 if working shown

A1

(b) 2 × their 0.84 … *oe*

or 2.4 tan 35

M1

1.68 … or 1.7

Answer on ft may be rounded

A1ft

[5]

M7. $\frac{3x}{x} = \frac{36}{x+4}$ *oe*

Scale factor 3 or $\frac{1}{3}$ *seen or implied*

M1

$3x\,(x + 4) = 36x$ *oe*

36 ÷ 3 (= 12)

M1

$3(x + 4) = 36$ *oe*

their 12 − 4

or $3x^2 + 12x = 36x$

M1

$3x + 12 = 36$

(x =) 8

or $x + 4 = 12$

or $x = 8$

or their 8 × 3

or $3x^2 - 24x = 0$

or $3x^2 = 24x$

M1

$(3x =)$ 24

24

A1

[5]

M8.(a) 180 − 42 − 90

or 90 − 42

or 138 − 90

oe

90 + 42 + 48 =180

M1

48

A1

(b) 360 − 102 − 64 − 57 (= 137)

or Angles in quadrilateral = 360 seen or implied

oe e.g. 223 + 137 = 360

M1

180 − their 137

M1

43

A1

[5]

M9.(a) (180 − 32) ÷ 2 or 148 ÷ 2

180 − 90 − 16

M1

74

A1

(b) 180 − 107 or 73 *oe*

or 107 − 90 or 17

M1

180 − their 73 − their 73 *oe*

or 17 × 2

(90 − their 73) × 2

M1dep

34

A1

[5]

M10. 180 − 107 or 73 *oe*

or 107 − 90 or 17

M1

180 − their 73 − their 73 *oe*

or 17 × 2

(90 − their 73) × 2

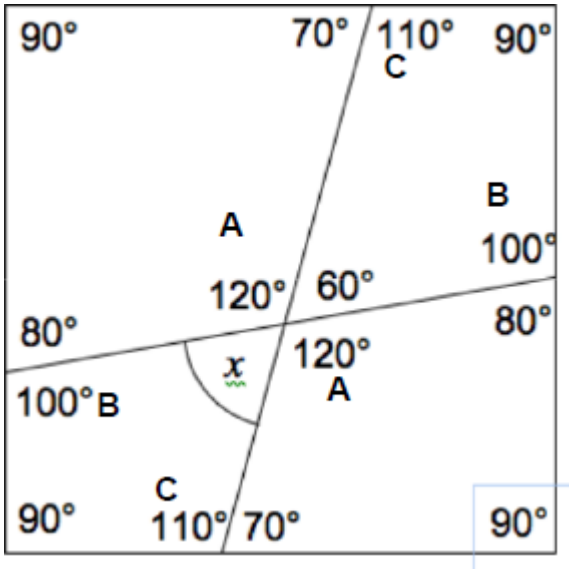
M1dep

34

A1

[3]

M11.



M1 for showing, or stating (right angles may be implied by subtraction) enough angles to solve the problem

*ie. An **obtuse** angle written at A*

*or two **obtuse** angles written at B and C in same quadrant*

*A1 for A = 120° **or***

*A1 for B = 100 **and** C = 110 in same quadrant*

M1,A1

180 − their A

or 360 − (90 + their B + their C)

M1dep

60°

60 no working SC3

A1

[4]

M12.(a) 180 − 156

M1

24

A1

(b) 360 − 90 − 149 *oe*

M1

121

A1

[4]

M13. Equates two sides $5w = 3w + 3$

$3w + 3 = w + 6$

$5w = w + 6$

M1

Collects like terms $5w - 3w = 3$

$3w - w = 6 - 3$

$5w - w = 6$

)

M1dep

(w =) 1.5

A1

Works out that all sides are 7.5

or solves another pair to get (w =) 1.5

Must have 3rd side = 7.5 and one side using their equation = 7.5 as a minimum

A1

[4]