HIGHER ONLY

HIGHER TIER

Name ..... Class .....

G22: Sine and cosine rules

Solve problems using the sine and cosine rules

20 marks · 25 minutes · Calculator allowed

1) A triangular field has sides 80 m, 100 m and 120 m. Find its largest angle.

..... °

[Question 1: 3 marks]

2) Boat A sails 12 km on a bearing of 030°. Boat B sails 8 km from the same port on a bearing of 110°. How far apart are the boats?

..... km

[Question 2: 4 marks]

---

3) From point *P* the angle of elevation of the top of a tower is 30°. From point *Q*, 20 m closer to the tower, it is 45°. Find the height of the tower.

..... m

[Question 3: 4 marks]

---

4) In triangle ABC, $BC = 9$ cm, angle $B = 70°$ and angle $C = 50°$. Find AC.

..... cm

[Question 4: 3 marks]

---

5) A parallelogram has sides 7 cm and 10 cm and an angle of 60°. Find the length of its longer diagonal.

..... cm

[Question 5: 3 marks]

---

6) A triangle has sides 6 cm and 8 cm with an angle of 50° between them. Find the third side and the area.

.....

[Question 6: 3 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	82.8	Largest angle opposite 120 (P1); cos = 0.125 (P1); A1.
2	13.2	Angle between paths 80° (P1); cosine rule (P1, P1); A1.
3	27.3	Triangle angles 30, 135, 15 or $h\cot 30 - h\cot 45 = 20$ (P1, P1); rearrange (P1); A1.
4	9.77	Angle $A = 60°$ (P1); sine rule (P1); A1.
5	14.8	Longer diagonal opposite 120° (P1); $\sqrt{49 + 100 + 70}$ (P1); A1.
6	6.19 cm; 18.4 cm^2	Cosine rule (P1); 6.19 (A1); $\frac{1}{2} \times 48 \sin 50$ (A1).