FOUNDATION & HIGHER

SAME AT BOTH TIERS

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

G21: Exact trigonometric values

Solve problems using exact values of trigonometric ratios

20 marks · 25 minutes · Non-calculator

1) Find the exact height and exact area of an equilateral triangle with sides of 10 cm.

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[Question 1: 3 marks]

2) A right-angled triangle has hypotenuse 12 cm and an angle of 30°. Find the exact lengths of the other sides and the exact area.

.....

[Question 2: 3 marks]

3) A ladder makes an angle of 60° with the ground. Its foot is 2 m from the wall. Find the exact length of the ladder and the exact height it reaches.

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[Question 3: 3 marks]

4) Use $\cos 45° = \frac{\sqrt{2}}{2}$ to find the exact length of the diagonal of a square with sides of 5 cm.

..... cm

[Question 4: 2 marks]

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5) A right-angled isosceles triangle has an area of 18 cm^2. Find the exact length of its hypotenuse.

..... cm

[Question 5: 3 marks]

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6) Find the acute angle x for which $\sin x = \cos 60°$

..... °

[Question 6: 2 marks]

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7) Find the exact area of a regular hexagon with sides of 4 cm.

..... cm^2

[Question 7: 4 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	$5\sqrt{3}$; $25\sqrt{3}$	$10\sin 60°$ (P1); height (A1); area (A1).
2	6, $6\sqrt{3}$; $18\sqrt{3}$	$12\sin 30$ and $12\cos 30$ (P1); sides (A1); area (A1).
3	4 m; $2\sqrt{3}$ m	$\frac{2}{\cos 60}$ (P1); 4 (A1); $2\tan 60$ (A1).
4	$5\sqrt{2}$	$\frac{5}{\cos 45°}$ (P1); A1.
5	$6\sqrt{2}$	Legs 6 (P1, P1); A1.
6	30	$\cos 60 = \frac{1}{2}$ (P1); A1.
7	$24\sqrt{3}$	6 equilateral triangles (P1); height $2\sqrt{3}$ (P1); each $4\sqrt{3}$ (P1); A1.