FOUNDATION & HIGHER

SAME AT BOTH TIERS

Name ..... **Class** .....

G21: Exact trigonometric values

Exact values of sin, cos *and* tan *for* 0°, 30°, 45°, 60° *and* 90°

20 marks · 25 minutes · Non-calculator

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1) Fill in the table of exact values. Two have been done for you.

	0°	30°	45°	60°	90°
sin		$\frac{1}{2}$			
cos				$\frac{1}{2}$	
tan					(*not defined*)

[Question 1: 10 marks]

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2) Work out $\sin 30° + \cos 60°$

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[Question 2: 1 marks]

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3) Find the exact value of $4\cos 30°$

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[Question 3: 1 marks]

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4) A right-angled triangle has a hypotenuse of 10 cm. One angle is 30°. Find the exact length of the side opposite the 30° angle.

..... cm

[Question 4: 2 marks]

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5) A right-angled triangle has an angle of 60°. The side next to this angle (not the hypotenuse) is 6 cm. Find the exact length of the side opposite the 60° angle.

..... cm

[Question 5: 2 marks]

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6) $\sin x = \frac{\sqrt{2}}{2}$ and $0° < x < 90°$. Find x.

..... °

[Question 6: 1 marks]

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7) $\tan x = \sqrt{3}$ and $0° < x < 90°$. Find x.

..... °

[Question 7: 1 marks]

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8) Find the exact value of $(\sin 45°)^2 + (\cos 45°)^2$

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[Question 8: 1 marks]

9) Find the exact value of $\sin 60° \times \tan 30°$

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[Question 9: 1 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	sin: 0, $\frac{\sqrt{2}}{2}$, $\frac{\sqrt{3}}{2}$, 1; cos: 1, $\frac{\sqrt{3}}{2}$, $\frac{\sqrt{2}}{2}$, 0; tan: 0, $\frac{\sqrt{3}}{3}$, 1, $\sqrt{3}$	B1 for each of the 10 missing values (accept $\frac{1}{\sqrt{2}}$ and $\frac{1}{\sqrt{3}}$).
2	1	B1.
3	$2\sqrt{3}$	B1.
4	5	$10\sin 30°$ (M1); A1.
5	$6\sqrt{3}$	$6\tan 60°$ (M1); A1.
6	45	B1.
7	60	B1.
8	1	B1.
9	$\frac{1}{2}$	B1.