TRIGONOMETRY

C3

1	Find to 2 decimal place	es the value of		
	a sec 23°	b cosec 185°	c cot 251.9°	d sec (-302°)
2	Find the exact value o	f		
	a cosec 30°	b cot 45°	c sec 150°	d cosec 300°
	e cot 90°	f sec 225°	g cosec 270°	h cot 330°
	i sec 660°	j cosec (-45°)	k cot (-240°)	l sec (-315°)
3	Find to 2 decimal plac	tes the value of		
	a $\cot 0.56^{\circ}$	b cosec 1.74°	c sec (-2.07°)	d $\cot 9.8^{\circ}$
4	Find in exact form, wi	th a rational denominat	or, the value of	
	a sec 0	b cosec $\frac{\pi}{4}$	c cot $\frac{3\pi}{4}$	d sec $\frac{4\pi}{3}$
	e cosec $\frac{2\pi}{3}$	f cot $\frac{7\pi}{2}$	g sec $\frac{5\pi}{4}$	h cosec $\left(-\frac{5\pi}{6}\right)$
	i $\cot \frac{11\pi}{6}$	j sec (-4π)	k cosec $\frac{13\pi}{4}$	l cot $(-\frac{7\pi}{3})$
5	Given that $\sin x = \frac{4}{5}$	and that $0 < x < 90^\circ$, f	ind without using a cal	culator the value of
	a $\cos x$	b $\tan x$	c cosec x	d sec x
6	Given that $\cos x = -\frac{1}{1}$	$\frac{5}{13}$ and that $90^{\circ} < x < 1$	80°, find without using	g a calculator the value of
	a $\sin x$	b sec x	c cosec x	d $\cot x$
		\mathbf{D} Sec λ		u coth
7			$y = \sec x^{\circ}$	
7	$\begin{array}{c} y \\ \hline \\ 0 \\ \hline \\ \end{array}$ The graph shows the constant of the		$y = \sec x^{\circ}$ interval $0 \le x \le 720$. points of the curve.	
7	y O O The graph shows the co a Write down the co b Write down the equ	$y = \sec x^{\circ}$ in the ordinates of the turning	$y = \sec x^{\circ}$ x interval $0 \le x \le 720$. points of the curve. es.	
	y O O The graph shows the co a Write down the co b Write down the equ	curve $y = \sec x^{\circ}$ in the ordinates of the turning uations of the asymptote	$y = \sec x^{\circ}$ x interval $0 \le x \le 720$. points of the curve. es.	180° ≤ <i>x</i> ≤ 180°.
	y O The graph shows the of a Write down the con- b Write down the equilibrium Sketch each pair of cur a $y = \sin x$ and Sketch each of the following	curve $y = \sec x^{\circ}$ in the ordinates of the turning uations of the asymptote urves on the same set of $y = \operatorname{cosec} x$	$y = \sec x^{\circ}$ interval $0 \le x \le 720$. points of the curve. es. axes in the interval -1 b $y = \tan x$ and the interval $0 \le x \le 2\pi$.	180° ≤ <i>x</i> ≤ 180°.
8	y O The graph shows the of a Write down the con- b Write down the equilibrium Sketch each pair of cur a $y = \sin x$ and Sketch each of the following	curve $y = \sec x^{\circ}$ in the ordinates of the turning uations of the asymptote trives on the same set of $y = \operatorname{cosec} x$ lowing curves for x in the	$y = \sec x^{\circ}$ interval $0 \le x \le 720$. points of the curve. es. axes in the interval -1 b $y = \tan x$ and the interval $0 \le x \le 2\pi$. pototes.	$180^{\circ} \le x \le 180^{\circ}.$ $y = \cot x$
8	y O O O O O O O O	curve $y = \sec x^{\circ}$ in the ordinates of the turning uations of the asymptote urves on the same set of $y = \csc x$ lowing curves for <i>x</i> in the equations of any asymptote	$y = \sec x^{\circ}$ interval $0 \le x \le 720$. points of the curve. es. axes in the interval -1 b $y = \tan x$ and the interval $0 \le x \le 2\pi$. pototes. sec x c y	$180^{\circ} \le x \le 180^{\circ}$. $y = \cot x$ Show the coordinates of any

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10 Solve each equation for x in the interval $0 \le x \le 2\pi$, giving your answers in terms of π .

a $\cot x = 1$	b sec $x = 2$	c cosec $x = \sqrt{2}$	d $\cot x = 0$
e sec $x = -1$	f cosec $x = -2$	g $\cot x = -\sqrt{3}$	h sec $x = -\sqrt{2}$

11 Solve each equation for θ in the interval $0 \le \theta \le 360^\circ$, giving your answers to 1 decimal place. **a** sec $\theta = 1.8$ **b** cosec $\theta = 2.57$ **c** cot $\theta = 1.06$ **d** sec $\theta = -2.63$

e	$\operatorname{cosec} \theta = 3$	f	$\cot \theta = -0.94$	g	sec $\theta = 1.888$	h	cosec $\theta = -1.2$
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12 Solve each equation for x in the interval $-180 \le x \le 180$ Give your answers to 1 decimal place where appropriate

$\mathbf{a} \operatorname{cosec} (x+30)^\circ = 2$	b $\cot(x-57)^\circ = 1.6$	c sec $2x^{\circ} = 2.35$
$\mathbf{d} 5 - 2\cot x^\circ = 0$	e $\sqrt{3} \sec (x - 60)^\circ = 2$	$\mathbf{f} 2\operatorname{cosec} \ \frac{1}{2}x^\circ - 7 = 0$
g sec $(2x - 18)^\circ = -1.3$	h cosec $3x^{\circ} = -3.4$	i $\cot(2x+135)^\circ = 1$

13 Solve each equation for θ in the interval $0 \le \theta \le 360$. Give your answers to 1 decimal place where appropriate.

- **a** $\csc^2 \theta^\circ 4 = 0$ **b** $\sec^2 \theta^\circ 2 \sec \theta^\circ 3 = 0$ **c** $\cot \theta^\circ \csc \theta^\circ = 6 \cot \theta^\circ$ **d** $\csc \theta^\circ = 4 \sec \theta^\circ$ **e** $2\cos \theta^\circ = \cot \theta^\circ$ **f** $5\sin \theta^\circ 2\csc \theta^\circ = 3$
- 14 Solve each equation for x in the interval $-\pi \le x \le \pi$. Give your answers to 2 decimal places.
 - **a** $2 \operatorname{cosec}^2 x + 5 \operatorname{cosec} x 12 = 0$ **b** $\operatorname{sec} x = 3 \tan x$ **c** $3 \operatorname{sec} x = 2 \cot x$ **d** $4 + \tan x = 5 \cot x$ **e** $\operatorname{cosec} x + 5 \cot x = 0$ **f** $6 \tan x 5 \operatorname{cosec} x = 0$

15 Prove each identity.

a $\sec x - \cos x \equiv \sin x \tan x$

$$\mathbf{c} \quad \frac{\cot x - \cos x}{1 - \sin x} \equiv \cot x$$

b $(1 + \cos x)(\csc x - \cot x) \equiv \sin x$ **d** $(\sin x + \tan x)(\cos x + \cot x) \equiv (1 + \sin x)(1 + \cos x)$

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yOy = f(x)

The diagram shows the curve y = f(x), where

 $f(x) \equiv 2 \cos x - 3 \sec x - 5, \ x \in \mathbb{R}, \ 0 \le x \le 2\pi.$

- **a** Find the coordinates of the point where the curve meets the *y*-axis.
- **b** Find the coordinates of the points where the curve crosses the *x*-axis.

Worksheet A continued