

1. Question | 9709 Feb-March 2016 P1 V2 Q4

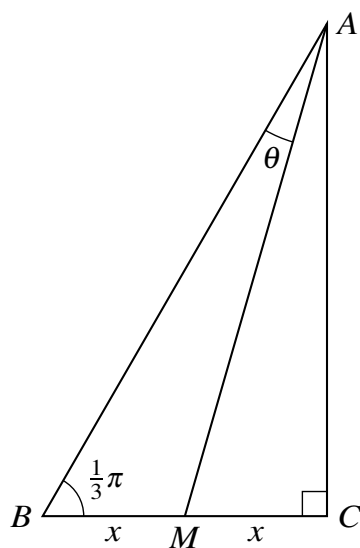
4 (a) Solve the equation $\sin^{-1}(3x) = -\frac{1}{3}\pi$, giving the solution in an exact form. [2]

(b) Solve, by factorising, the equation $2 \cos \theta \sin \theta - 2 \cos \theta - \sin \theta + 1 = 0$ for $0 \leq \theta \leq \pi$. [4]

2. Question | 9709 May-June 2016 P1 V1 Q2

2 Solve the equation $3 \sin^2 \theta = 4 \cos \theta - 1$ for $0^\circ \leq \theta \leq 360^\circ$. [4]

3. Question | 9709 May-June 2016 P1 V2 Q5

5

In the diagram, triangle ABC is right-angled at C and M is the mid-point of BC . It is given that angle $ABC = \frac{1}{3}\pi$ radians and angle $BAM = \theta$ radians. Denoting the lengths of BM and MC by x ,

(i) find AM in terms of x , [3]

(ii) show that $\theta = \frac{1}{6}\pi - \tan^{-1}\left(\frac{1}{2\sqrt{3}}\right)$. [2]

4. Question | 9709 May-June 2016 P1 V2 Q7

7 (i) Prove the identity $\frac{1 + \cos \theta}{1 - \cos \theta} - \frac{1 - \cos \theta}{1 + \cos \theta} \equiv \frac{4}{\sin \theta \tan \theta}$. [4]

(ii) Hence solve, for $0^\circ < \theta < 360^\circ$, the equation

$$\sin \theta \left(\frac{1 + \cos \theta}{1 - \cos \theta} - \frac{1 - \cos \theta}{1 + \cos \theta} \right) = 3. \quad [3]$$

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5. Question | 9709 May-June 2016 P1 V3 Q8

- 8** (i) Show that $3 \sin x \tan x - \cos x + 1 = 0$ can be written as a quadratic equation in $\cos x$ and hence solve the equation $3 \sin x \tan x - \cos x + 1 = 0$ for $0 \leq x \leq \pi$. [5]
- (ii) Find the solutions to the equation $3 \sin 2x \tan 2x - \cos 2x + 1 = 0$ for $0 \leq x \leq \pi$. [3]

6. Question | 9709 Oct-Nov 2016 P1 V1 Q6

- 6** (i) Show that $\cos^4 x \equiv 1 - 2 \sin^2 x + \sin^4 x$. [1]
- (ii) Hence, or otherwise, solve the equation $8 \sin^4 x + \cos^4 x = 2 \cos^2 x$ for $0^\circ \leq x \leq 360^\circ$. [5]

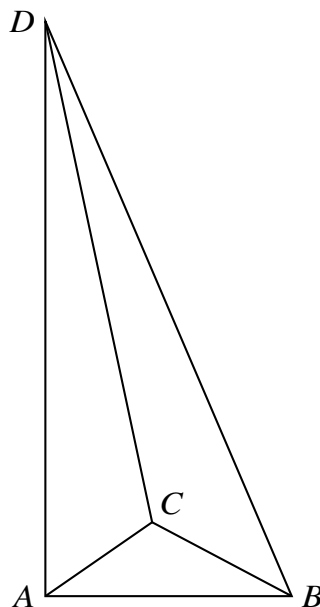
7. Question | 9709 Oct-Nov 2016 P1 V2 Q2

- 2** (i) Express the equation $\sin 2x + 3 \cos 2x = 3(\sin 2x - \cos 2x)$ in the form $\tan 2x = k$, where k is a constant. [2]
- (ii) Hence solve the equation for $-90^\circ \leq x \leq 90^\circ$. [3]

8. Question | 9709 Oct-Nov 2016 P1 V3 Q3

- 3** Showing all necessary working, solve the equation $6 \sin^2 x - 5 \cos^2 x = 2 \sin^2 x + \cos^2 x$ for $0^\circ \leq x \leq 360^\circ$. [4]

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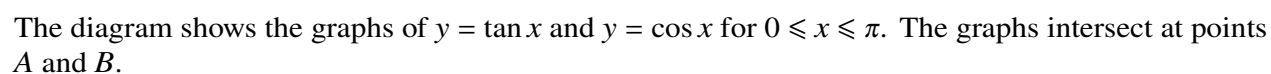


The diagram shows a triangular pyramid $ABCD$. It is given that

$$\overrightarrow{AB} = 3\mathbf{i} + \mathbf{j} + \mathbf{k}, \quad \overrightarrow{AC} = \mathbf{i} - 2\mathbf{j} - \mathbf{k} \quad \text{and} \quad \overrightarrow{AD} = \mathbf{i} + 4\mathbf{j} - 7\mathbf{k}.$$

- (i) Verify, showing all necessary working, that each of the angles DAB , DAC and CAB is 90° . [3]
- (ii) Find the exact value of the area of the triangle ABC , and hence find the exact value of the volume of the pyramid. [4]

[The volume V of a pyramid of base area A and vertical height h is given by $V = \frac{1}{3}Ah$.]



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10. Question part 2/2 | 9709 Feb-March 2017 P1 V2 Q5

[illegible]

(ii) Find by calculation the coordinates of B .

[3]

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11. Question part 1/2 | 9709 May-June 2017 P1 V1 Q3

3 (i) Prove the identity $\frac{1 + \cos \theta}{\sin \theta} + \frac{\sin \theta}{1 + \cos \theta} \equiv \frac{2}{\sin \theta}$. [3]

[illegible]

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11. Question part 2/2 | 9709 May-June 2017 P1 V1 Q3

(ii) Hence solve the equation $\frac{1 + \cos \theta}{\sin \theta} + \frac{\sin \theta}{1 + \cos \theta} = \frac{3}{\cos \theta}$ for $0^\circ \leq \theta \leq 360^\circ$. [3]

[illegible]

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5 The equation of a curve is $y = 2 \cos x$.

- Points P and Q lie on the curve and have x -coordinates of $\frac{1}{3}\pi$ and π respectively.

- [illegible]

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The line through P and Q meets the x -axis at $H(h, 0)$ and the y -axis at $K(0, k)$.

(iii) Show that $h = \frac{5}{9}\pi$ and find the value of k . [3]

[illegible]

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13. Question part 1/2 | 9709 May-June 2017 P1 V2 Q3

3 (i) Prove the identity $\left(\frac{1}{\cos \theta} - \tan \theta\right)^2 \equiv \frac{1 - \sin \theta}{1 + \sin \theta}$. [3]

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13. Question part 2/2 | 9709 May-June 2017 P1 V2 Q3

(ii) Hence solve the equation $\left(\frac{1}{\cos \theta} - \tan \theta\right)^2 = \frac{1}{2}$, for $0^\circ \leq \theta \leq 360^\circ$. [3]

[illegible]

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14. Question part 1/2 | 9709 May-June 2017 P1 V3 Q5

5 (i) Show that the equation $\frac{2 \sin \theta + \cos \theta}{\sin \theta + \cos \theta} = 2 \tan \theta$ may be expressed as $\cos^2 \theta = 2 \sin^2 \theta$. [3]

[illegible]

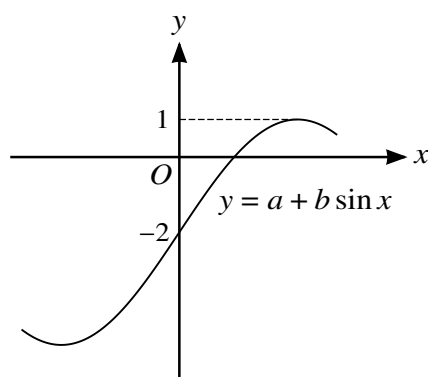
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14. Question part 2/2 | 9709 May-June 2017 P1 V3 Q5

(ii) Hence solve the equation $\frac{2 \sin \theta + \cos \theta}{\sin \theta + \cos \theta} = 2 \tan \theta$ for $0^\circ < \theta < 180^\circ$. [3]

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$$(\sin \theta + 2 \cos \theta)(1 + \sin \theta - \cos \theta) = \sin \theta(1 + \cos \theta)$$

may be expressed as $3 \cos^2 \theta - 2 \cos \theta - 1 = 0$. [3]

[illegible]
$$(\sin \theta + 2 \cos \theta)(1 + \sin \theta - \cos \theta) = \sin \theta(1 + \cos \theta)$$

for $-180^\circ \leq \theta \leq 180^\circ$. [4]

[illegible]

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16. Question part 1/2 | 9709 Oct-Nov 2017 P1 V2 Q5

5 (i) Show that the equation $\cos 2x(\tan^2 2x + 3) + 3 = 0$ can be expressed as

$$2 \cos^2 2x + 3 \cos 2x + 1 = 0. \quad [3]$$

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16. Question part 2/2 | 9709 Oct-Nov 2017 P1 V2 Q5

(ii) Hence solve the equation $\cos 2x(\tan^2 2x + 3) + 3 = 0$ for $0^\circ \leq x \leq 180^\circ$. [4]

[illegible]

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6 (a) The function f , defined by $f : x \mapsto a + b \sin x$ for $x \in \mathbb{R}$, is such that $f(\frac{1}{6}\pi) = 4$ and $f(\frac{1}{2}\pi) = 3$.

[illegible]

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17. Question part 2/2 | 9709 Oct-Nov 2017 P1 V2 Q6

- (b) The function g is defined by $g : x \mapsto c + d \sin x$ for $x \in \mathbb{R}$. The range of g is given by $-4 \leq g(x) \leq 10$. Find the values of the constants c and d . [3]

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18. Question part 1/2 | 9709 Oct-Nov 2017 P1 V3 Q5

5 (i) Show that the equation $\frac{\cos \theta + 4}{\sin \theta + 1} + 5 \sin \theta - 5 = 0$ may be expressed as $5 \cos^2 \theta - \cos \theta - 4 = 0$.

[3]

[illegible]

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18. Question part 2/2 | 9709 Oct-Nov 2017 P1 V3 Q5

(ii) Hence solve the equation $\frac{\cos \theta + 4}{\sin \theta + 1} + 5 \sin \theta - 5 = 0$ for $0^\circ \leq \theta \leq 360^\circ$. [4]

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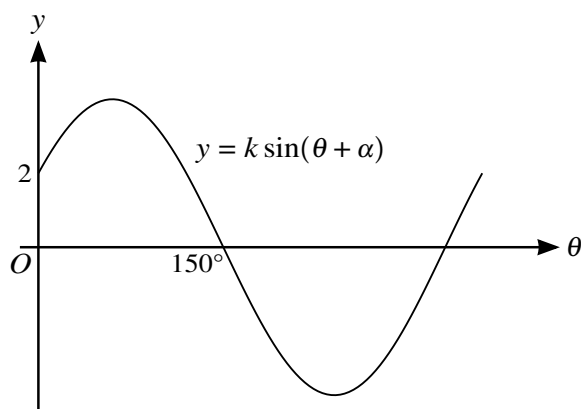
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19. Question part 1/2 | 9709 Feb-March 2018 P1 V2 Q5

- 5 (a)** Express the equation $\frac{5 + 2 \tan x}{3 + 2 \tan x} = 1 + \tan x$ as a quadratic equation in $\tan x$ and hence solve the equation for $0 \leq x \leq \pi$. [4]

This image shows a full page of a worksheet designed for handwriting practice. It consists of approximately 20 horizontal rows. Each row is defined by two parallel dotted lines, creating a series of uniform gaps for writing. The lines are evenly spaced across the entire page, providing a guide for letter height and placement. There is no text or other markings on the page.



The diagram shows part of the graph of $y = k \sin(\theta + \alpha)$, where k and α are constants and $0^\circ < \alpha < 180^\circ$. Find the value of α and the value of k . [2]

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20. Question part 1/2 | 9709 May-June 2018 P1 V1 Q4

4 (i) Prove the identity $(\sin \theta + \cos \theta)(1 - \sin \theta \cos \theta) \equiv \sin^3 \theta + \cos^3 \theta$. [3]

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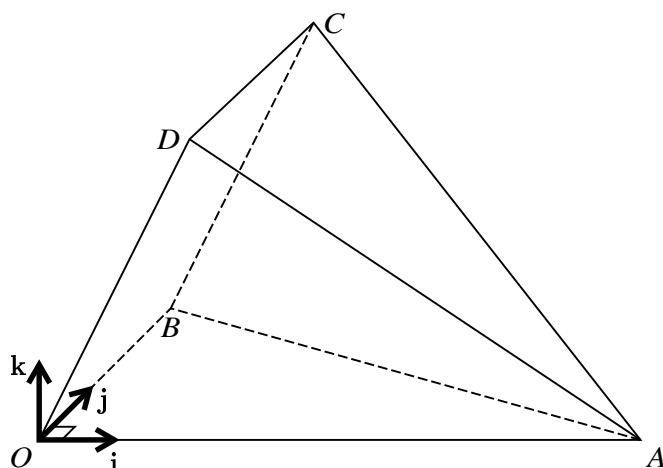
20. Question part 2/2 | 9709 May-June 2018 P1 V1 Q4

(ii) Hence solve the equation $(\sin \theta + \cos \theta)(1 - \sin \theta \cos \theta) = 3 \cos^3 \theta$ for $0^\circ \leq \theta \leq 360^\circ$. [3]

[illegible]

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This image shows a full page of white paper with ten horizontal dashed lines, typical of primary-ruled notebook paper. The lines are evenly spaced and run across the width of the page. There is no handwriting or other markings on the paper.



(i) Express each of the vectors $\overrightarrow{DA}$ and $\overrightarrow{CA}$ in terms of $\mathbf{i}$, $\mathbf{j}$ and $\mathbf{k}$. [2]

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22. Question part 2/2 | 9709 May-June 2018 P1 V2 Q5

(ii) Use a scalar product to find angle CAD .

[4]

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23. Question part 1/2 | 9709 May-June 2018 P1 V2 Q10

10 (i) Solve the equation $2 \cos x + 3 \sin x = 0$, for $0^\circ \leq x \leq 360^\circ$.

[illegible]

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23. Question part 2/2 | 9709 May-June 2018 P1 V2 Q10

(ii) Sketch, on the same diagram, the graphs of $y = 2 \cos x$ and $y = -3 \sin x$ for $0^\circ \leq x \leq 360^\circ$. [3]

(iii) Use your answers to parts **(i)** and **(ii)** to find the set of values of x for $0^\circ \leq x \leq 360^\circ$ for which $2 \cos x + 3 \sin x > 0$. [2]

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24. Question part 1/2 | 9709 May-June 2018 P1 V3 Q7

7 (a) (i) Express $\frac{\tan^2 \theta - 1}{\tan^2 \theta + 1}$ in the form $a \sin^2 \theta + b$, where a and b are constants to be found. [3]

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(ii) Hence, or otherwise, and showing all necessary working, solve the equation

$$\frac{\tan^2 \theta - 1}{\tan^2 \theta + 1} = \frac{1}{4}$$

for $-90^\circ \leq \theta \leq 0^\circ$. [2]

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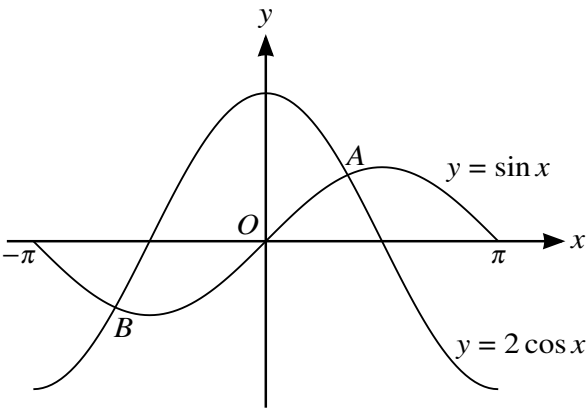
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(b)



The diagram shows the graphs of $y = \sin x$ and $y = 2 \cos x$ for $-\pi \leq x \leq \pi$. The graphs intersect at the points A and B .

(i) Find the x -coordinate of A . [2]

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(ii) Find the y -coordinate of B . [2]

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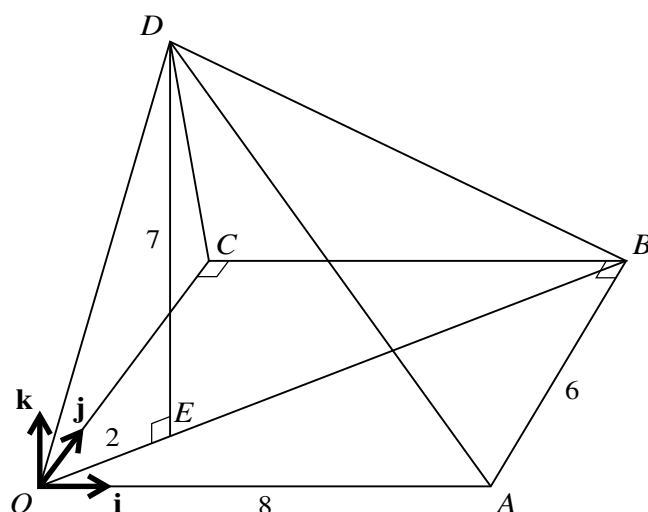
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The diagram shows a pyramid $OABCD$ with a horizontal rectangular base $OABC$. The sides OA and AB have lengths of 8 units and 6 units respectively. The point E on OB is such that $OE = 2$ units. The point D of the pyramid is 7 units vertically above E . Unit vectors $\mathbf{i}$, $\mathbf{j}$ and $\mathbf{k}$ are parallel to OA , OC and ED respectively.

- (i) Show that $\overrightarrow{OE} = 1.6\mathbf{i} + 1.2\mathbf{j}$. [2]

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- (ii) Use a scalar product to find angle BDO . [7]

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25. Question part 2/2 | 9709 May-June 2018 P1 V3 Q9

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Topical questions | 99 questions

5 (i) Show that the equation

may be expressed as $9 \cos^2 \theta - 22 \cos \theta + 4 = 0$. [3]

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Topical questions | 99 questions

(ii) Hence solve the equation

$$\frac{\cos \theta - 4}{\sin \theta} - \frac{4 \sin \theta}{5 \cos \theta - 2} = 0$$

$$\text{for } 0^\circ \leq \theta \leq 360^\circ. \quad [3]$$
[illegible]

4 Functions f and g are defined by

$$f : x \mapsto 2 - 3 \cos x \quad \text{for } 0 \leq x \leq 2\pi,$$

$$g : x \mapsto \frac{1}{2}x \quad \text{for } 0 \leq x \leq 2\pi.$$

(i) Solve the equation $fg(x) = 1$. [3]

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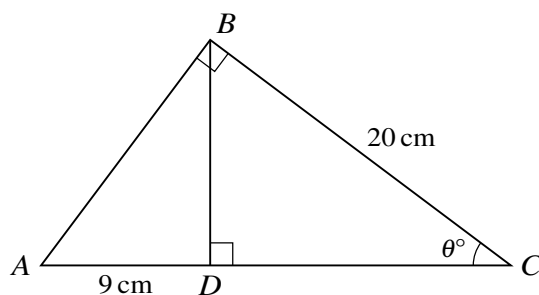
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(ii) Sketch the graph of $y = f(x)$. [3]



The diagram shows a triangle ABC in which $BC = 20$ cm and angle $ABC = 90^\circ$. The perpendicular from B to AC meets AC at D and $AD = 9$ cm. Angle $BCA = \theta^\circ$.

- (i) By expressing the length of BD in terms of θ in each of the triangles ABD and DBC , show that $20 \sin^2 \theta = 9 \cos \theta$. [4]

[illegible]

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28. Question part 2/2 | 9709 Oct-Nov 2018 P1 V2 Q6

(ii) Hence, showing all necessary working, calculate θ .

[3]

[illegible]

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29. Question part 1/2 | 9709 Oct-Nov 2018 P1 V3 Q7

7 (i) Show that $\frac{\tan \theta + 1}{1 + \cos \theta} + \frac{\tan \theta - 1}{1 - \cos \theta} \equiv \frac{2(\tan \theta - \cos \theta)}{\sin^2 \theta}$. [3]

[illegible]

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29. Question part 2/2 | 9709 Oct-Nov 2018 P1 V3 Q7

(ii) Hence, showing all necessary working, solve the equation

$$\frac{\tan \theta + 1}{1 + \cos \theta} + \frac{\tan \theta - 1}{1 - \cos \theta} = 0$$

for $0^\circ < \theta < 90^\circ$.

[4]

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Topical questions | 99 questions

5 Two vectors, $\mathbf{u}$ and $\mathbf{v}$, are such that

$$\mathbf{u} = \begin{pmatrix} q \\ 2 \\ 6 \end{pmatrix} \quad \text{and} \quad \mathbf{v} = \begin{pmatrix} 8 \\ q-1 \\ q^2-7 \end{pmatrix},$$

(i) Find the values of q for which $\mathbf{u}$ is perpendicular to $\mathbf{v}$. [3]

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30. Question part 2/2 | 9709 Feb-March 2019 P1 V2 Q5

(ii) Find the angle between $\mathbf{u}$ and $\mathbf{v}$ when $q = 0$.

[4]

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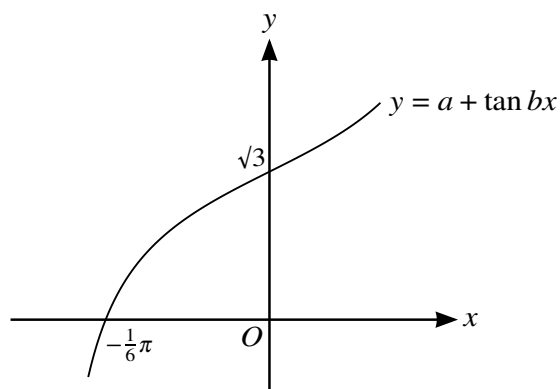
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31. Question part 1/2 | 9709 Feb-March 2019 P1 V2 Q7

7 (a) Solve the equation $3 \sin^2 2\theta + 8 \cos 2\theta = 0$ for $0^\circ \leq \theta \leq 180^\circ$. [5]

[illegible]

(b)



The diagram shows part of the graph of $y = a + \tan bx$, where x is measured in radians and a and b are constants. The curve intersects the x -axis at $(-\frac{1}{6}\pi, 0)$ and the y -axis at $(0, \sqrt{3})$. Find the values of a and b . [3]

[illegible]

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32. Question part 1/2 | 9709 May-June 2019 P1 V1 Q6

6 (i) Prove the identity $\left(\frac{1}{\cos x} - \tan x\right)^2 \equiv \frac{1 - \sin x}{1 + \sin x}$. [4]

[illegible]

Topical questions | 99 questions

(ii) Hence solve the equation $\left(\frac{1}{\cos 2x} - \tan 2x\right)^2 = \frac{1}{3}$ for $0 \leq x \leq \pi$. [3]

Topical questions | 99 questions

4 Angle x is such that $\sin x = a + b$ and $\cos x = a - b$, where a and b are constants.

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[illegible]

34. Question | 9709 May-June 2019 P1 V2 Q6

- 6

The equation of a curve is $y = 3 \cos 2x$ and the equation of a line is $2y + \frac{3x}{\pi} = 5$.
- (i)

State the smallest and largest values of y for both the curve and the line for $0 \leq x \leq 2\pi$. [3]

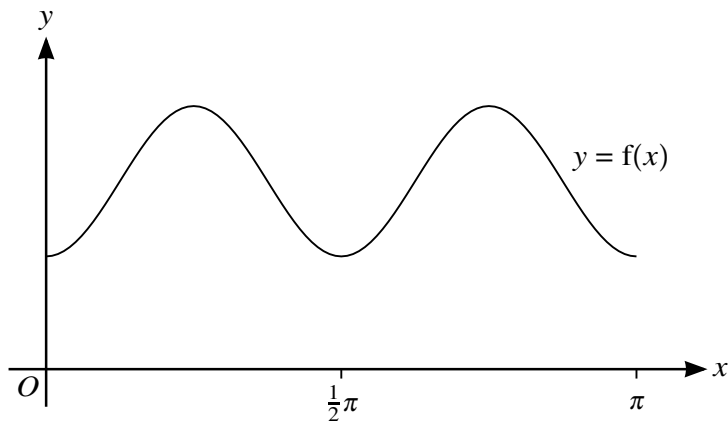
- (ii)

Sketch, on the same diagram, the graphs of $y = 3 \cos 2x$ and $2y + \frac{3x}{\pi} = 5$ for $0 \leq x \leq 2\pi$. [3]

- (iii)

State the number of solutions of the equation $6 \cos 2x = 5 - \frac{3x}{\pi}$ for $0 \leq x \leq 2\pi$. [1]

9



The function $f : x \mapsto p \sin^2 2x + q$ is defined for $0 \leq x \leq \pi$, where p and q are positive constants. The diagram shows the graph of $y = f(x)$.

(i) In terms of p and q , state the range of f . [2]

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(ii) State the number of solutions of the following equations.

(a) $f(x) = p + q$ [1]

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(b) $f(x) = q$ [1]

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(c) $f(x) = \frac{1}{2}p + q$ [1]

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35. Question part 2/2 | 9709 May-June 2019 P1 V3 Q9

(iii) For the case where $p = 3$ and $q = 2$, solve the equation $f(x) = 4$, showing all necessary working. [5]

[illegible]

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36. Question part 1/2 | 9709 Oct-Nov 2019 P1 V1 Q5

5 (i) Given that $4 \tan x + 3 \cos x + \frac{1}{\cos x} = 0$, show, without using a calculator, that $\sin x = -\frac{2}{3}$. [3]

[illegible]

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(ii) Hence, showing all necessary working, solve the equation

$$4 \tan(2x - 20^\circ) + 3 \cos(2x - 20^\circ) + \frac{1}{\cos(2x - 20^\circ)} = 0$$

for $0^\circ \leq x \leq 180^\circ$.

[4]

[illegible]

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37. Question part 1/2 | 9709 Oct-Nov 2019 P1 V2 Q6

- 6 (a)** Given that $x > 0$, find the two smallest values of x , in radians, for which $3 \tan(2x + 1) = 1$. Show all necessary working. [4]

[illegible]

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37. Question part 2/2 | 9709 Oct-Nov 2019 P1 V2 Q6

(b) The function $f : x \mapsto 3 \cos^2 x - 2 \sin^2 x$ is defined for $0 \leq x \leq \pi$.

(i) Express $f(x)$ in the form $a \cos^2 x + b$, where a and b are constants.

[1]

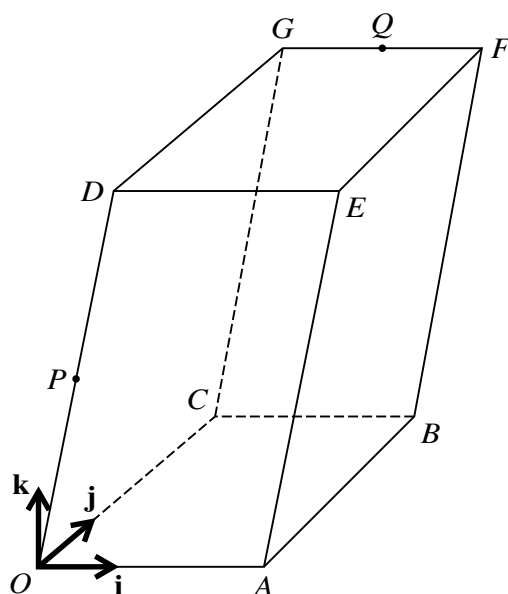
[illegible]

(ii) Find the range of f .

[2]

[illegible]

7



(i) Express each of the vectors $\overrightarrow{PB}$ and $\overrightarrow{PQ}$ in terms of $\mathbf{i}$, $\mathbf{j}$ and $\mathbf{k}$. [4]

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Topical questions | 99 questions

(ii) Determine whether P is nearer to Q or to B . [2]

[illegible]

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9709 Mathematics Paper 1 - Trigonometry

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39. Question part 1/2 | 9709 Oct-Nov 2019 P1 V3 Q7

- 7 (i) Show that the equation $3 \cos^4 \theta + 4 \sin^2 \theta - 3 = 0$ can be expressed as $3x^2 - 4x + 1 = 0$, where $x = \cos^2 \theta$. [2]

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9709 Mathematics Paper 1 - Trigonometry

Topical questions | 99 questions

39. Question part 2/2 | 9709 Oct-Nov 2019 P1 V3 Q7

(ii) Hence solve the equation $3 \cos^4 \theta + 4 \sin^2 \theta - 3 = 0$ for $0^\circ \leq \theta \leq 180^\circ$.

[5]

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9709 Mathematics Paper 1 - Trigonometry

Topical questions | 99 questions

40. Question | 9709 Feb-March 2020 P1 V2 Q5

5 Solve the equation

$$\frac{\tan \theta + 3 \sin \theta + 2}{\tan \theta - 3 \sin \theta + 1} = 2$$

for $0^\circ \leq \theta \leq 90^\circ$.

[5]

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

Topical questions | 99 questions

11 (a) Solve the equation $3 \tan^2 x - 5 \tan x - 2 = 0$ for $0^\circ \leq x \leq 180^\circ$. [4]

[illegible]

- [illegible]

9709 Mathematics Paper 1 - Trigonometry

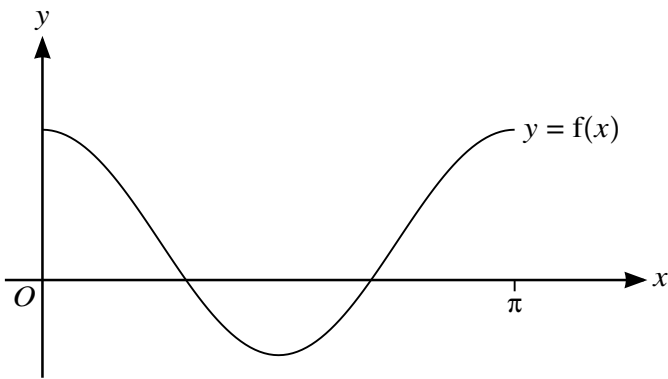
Topical questions | 99 questions

41. Question part 2/2 | 9709 Feb-March 2020 P1 V2 Q11

- (c) For the equation $3 \tan^2 x - 5 \tan x + k = 0$, state the value of k for which there are three solutions in the interval $0^\circ \leq x \leq 180^\circ$, and find these solutions. [3]

[illegible]

4



The diagram shows the graph of $y = f(x)$, where $f(x) = \frac{3}{2} \cos 2x + \frac{1}{2}$ for $0 \leq x \leq \pi$.

(a) State the range of f . [2]

.....

.....

.....

A function g is such that $g(x) = f(x) + k$, where k is a positive constant. The x -axis is a tangent to the curve $y = g(x)$.

(b) State the value of k and hence describe fully the transformation that maps the curve $y = f(x)$ on to $y = g(x)$. [2]

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(c) State the equation of the curve which is the reflection of $y = f(x)$ in the x -axis. Give your answer in the form $y = a \cos 2x + b$, where a and b are constants. [1]

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9709 Mathematics Paper 1 - Trigonometry

Topical questions | 99 questions

43. Question part 1/2 | 9709 May-June 2020 P1 V1 Q7

7 (a) Prove the identity $\frac{1 + \sin \theta}{\cos \theta} + \frac{\cos \theta}{1 + \sin \theta} \equiv \frac{2}{\cos \theta}$. [3]

[illegible]

9709 Mathematics Paper 1 - Trigonometry

Topical questions | 99 questions

43. Question part 2/2 | 9709 May-June 2020 P1 V1 Q7

(b) Hence solve the equation $\frac{1 + \sin \theta}{\cos \theta} + \frac{\cos \theta}{1 + \sin \theta} = \frac{3}{\sin \theta}$, for $0 \leq \theta \leq 2\pi$. [3]

[illegible]

9709 Mathematics Paper 1 - Trigonometry

Topical questions | 99 questions

44. Question | 9709 May-June 2020 P1 V2 Q2

- 2 (a)** Express the equation $3 \cos \theta = 8 \tan \theta$ as a quadratic equation in $\sin \theta$. [3]

[illegible]

- (b)** Hence find the acute angle, in degrees, for which $3 \cos \theta = 8 \tan \theta$. [2]

[illegible]

9709 Mathematics Paper 1 - Trigonometry

Topical questions | 99 questions

45. Question part 1/2 | 9709 May-June 2020 P1 V3 Q7

7 (a) Show that $\frac{\tan \theta}{1 + \cos \theta} + \frac{\tan \theta}{1 - \cos \theta} \equiv \frac{2}{\sin \theta \cos \theta}$. [4]

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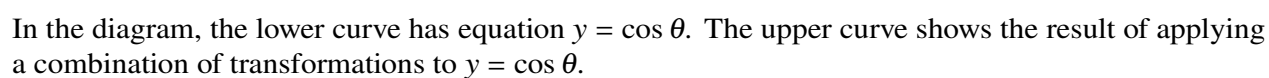
9709 Mathematics Paper 1 - Trigonometry

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45. Question part 2/2 | 9709 May-June 2020 P1 V3 Q7

(b) Hence solve the equation $\frac{\tan \theta}{1 + \cos \theta} + \frac{\tan \theta}{1 - \cos \theta} = \frac{6}{\tan \theta}$ for $0^\circ < \theta < 180^\circ$. [4]

[illegible]



Find, in terms of a cosine function, the equation of the upper curve. [3]

[illegible]

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Topical questions | 99 questions

47. Question part 1/2 | 9709 Oct-Nov 2020 P1 V1 Q7

7 (a) Show that $\frac{\sin \theta}{1 - \sin \theta} - \frac{\sin \theta}{1 + \sin \theta} \equiv 2 \tan^2 \theta$. [3]

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Topical questions | 99 questions

(b) Hence solve the equation $\frac{\sin \theta}{1 - \sin \theta} - \frac{\sin \theta}{1 + \sin \theta} = 8$, for $0^\circ < \theta < 180^\circ$. [3]

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Topical questions | 99 questions

6 (a) Prove the identity $\left(\frac{1}{\cos x} - \tan x\right)\left(\frac{1}{\sin x} + 1\right) \equiv \frac{1}{\tan x}$. [4]

[illegible]

(b) Hence solve the equation $\left(\frac{1}{\cos x} - \tan x\right)\left(\frac{1}{\sin x} + 1\right) = 2 \tan^2 x$ for $0^\circ \leq x \leq 180^\circ$. [2]

[illegible]

11 A curve has equation $y = 3 \cos 2x + 2$ for $0 \leq x \leq \pi$.

(a) State the greatest and least values of y . [2]

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.....

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.....

(b) Sketch the graph of $y = 3 \cos 2x + 2$ for $0 \leq x \leq \pi$. [2]

(c) By considering the straight line $y = kx$, where k is a constant, state the number of solutions of the equation $3 \cos 2x + 2 = kx$ for $0 \leq x \leq \pi$ in each of the following cases.

(i) $k = -3$ [1]

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(ii) $k = 1$ [1]

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.....

(iii) $k = 3$ [1]

.....

.....

Functions f , g and h are defined for $x \in \mathbb{R}$ by

$$f(x) = 3 \cos 2x + 2,$$

$$g(x) = f(2x) + 4,$$

$$h(x) = 2f\left(x + \frac{1}{2}\pi\right).$$

- (d) Describe fully a sequence of transformations that maps the graph of $y = f(x)$ on to $y = g(x)$. [2]

This image shows a full page of white paper with ten horizontal dashed lines, typical of primary school handwriting practice paper. The lines are evenly spaced and extend across the entire width of the page. There is no text or other markings on the paper.

- (e) Describe fully a sequence of transformations that maps the graph of $y = f(x)$ on to $y = h(x)$. [2]

[illegible]

Topical questions | 99 questions

Additional Page

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50. Question | 9709 Oct-Nov 2020 P1 V3 Q3

3 Solve the equation $3 \tan^2 \theta + 1 = \frac{2}{\tan^2 \theta}$ for $0^\circ < \theta < 180^\circ$. [5]

[illegible]

9709 Mathematics Paper 1 - Trigonometry

Topical questions | 99 questions

51. Question | 9709 Feb-March 2021 P1 V2 Q3

3 Solve the equation $\frac{\tan \theta + 2 \sin \theta}{\tan \theta - 2 \sin \theta} = 3$ for $0^\circ < \theta < 180^\circ$. [4]

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53. Question part 1/2 | 9709 May-June 2021 P1 V1 Q7

7 (a) Prove the identity $\frac{1 - 2 \sin^2 \theta}{1 - \sin^2 \theta} \equiv 1 - \tan^2 \theta$. [2]

[illegible]

9709 Mathematics Paper 1 - Trigonometry

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53. Question part 2/2 | 9709 May-June 2021 P1 V1 Q7

(b) Hence solve the equation $\frac{1 - 2 \sin^2 \theta}{1 - \sin^2 \theta} = 2 \tan^4 \theta$ for $0^\circ \leq \theta \leq 180^\circ$. [3]

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Topical questions | 99 questions

54. Question part 1/2 | 9709 May-June 2021 P1 V2 Q10

10 (a) Prove the identity $\frac{1 + \sin x}{1 - \sin x} - \frac{1 - \sin x}{1 + \sin x} \equiv \frac{4 \tan x}{\cos x}$. [4]

[illegible]

Topical questions | 99 questions

(b) Hence solve the equation $\frac{1 + \sin x}{1 - \sin x} - \frac{1 - \sin x}{1 + \sin x} = 8 \tan x$ for $0 \leq x \leq \frac{1}{2}\pi$. [3]

4 (a) Show that the equation

$$\frac{\tan x + \sin x}{\tan x - \sin x} = k,$$

where k is a constant, may be expressed as

$$\frac{1 + \cos x}{1 - \cos x} = k. \qquad [2]$$

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(b) Hence express $\cos x$ in terms of k . [2]

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(c) Hence solve the equation $\frac{\tan x + \sin x}{\tan x - \sin x} = 4$ for $-\pi < x < \pi$. [2]

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56. Question | 9709 Oct-Nov 2021 P1 V1 Q3

3 Solve, by factorising, the equation

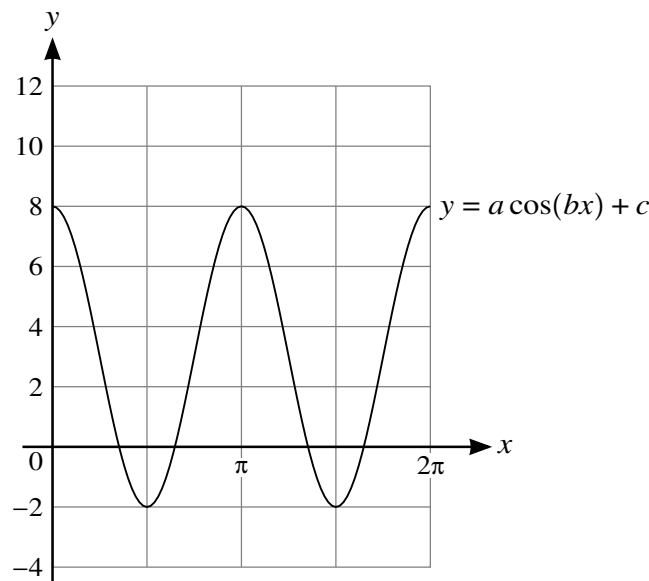
$$6 \cos \theta \tan \theta - 3 \cos \theta + 4 \tan \theta - 2 = 0,$$

for $0^\circ \leq \theta \leq 180^\circ$.

[4]

[illegible]

5



The diagram shows part of the graph of $y = a \cos(bx) + c$.

(a) Find the values of the positive integers a , b and c . [3]

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.....

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(b) For these values of a , b and c , use the given diagram to determine the number of solutions in the interval $0 \leq x \leq 2\pi$ for each of the following equations.

(i) $a \cos(bx) + c = \frac{6}{\pi}x$ [1]

.....

.....

(ii) $a \cos(bx) + c = 6 - \frac{6}{\pi}x$ [1]

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9709 Mathematics Paper 1 - Trigonometry

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58. Question | 9709 Oct-Nov 2021 P1 V2 Q1

1 Solve the equation $2 \cos \theta = 7 - \frac{3}{\cos \theta}$ for $-90^\circ < \theta < 90^\circ$. [4]

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Topical questions | 99 questions

7 (a) Show that the equation $\frac{\tan x + \cos x}{\tan x - \cos x} = k$, where k is a constant, can be expressed as

$$(k+1)\sin^2 x + (k-1)\sin x - (k+1) = 0. \quad [4]$$

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59. Question part 2/2 | 9709 Oct-Nov 2021 P1 V3 Q7

(b) Hence solve the equation $\frac{\tan x + \cos x}{\tan x - \cos x} = 4$ for $0^\circ \leq x \leq 360^\circ$. [4]

[illegible]

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60. Question part 1/2 | 9709 Feb-March 2022 P1 V2 Q7

7 (a) Show that $\frac{\sin \theta + 2 \cos \theta}{\cos \theta - 2 \sin \theta} - \frac{\sin \theta - 2 \cos \theta}{\cos \theta + 2 \sin \theta} \equiv \frac{4}{5 \cos^2 \theta - 4}$. [4]

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

Topical questions | 99 questions

(b) Hence solve the equation $\frac{\sin \theta + 2 \cos \theta}{\cos \theta - 2 \sin \theta} - \frac{\sin \theta - 2 \cos \theta}{\cos \theta + 2 \sin \theta} = 5$ for $0^\circ < \theta < 180^\circ$. [3]

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61. Question part 1/2 | 9709 May-June 2022 P1 V1 Q4

4 (a) Prove the identity $\frac{\sin^3 \theta}{\sin \theta - 1} - \frac{\sin^2 \theta}{1 + \sin \theta} \equiv -\tan^2 \theta (1 + \sin^2 \theta)$. [4]

[illegible]

Topical questions | 99 questions

[illegible]
$$\frac{\sin^3 \theta}{\sin \theta - 1} - \frac{\sin^2 \theta}{1 + \sin \theta} = \tan^2 \theta (1 - \sin^2 \theta)$$

[2]

[illegible]

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Topical questions | 99 questions

62. Question part 1/3 | 9709 May-June 2022 P1 V2 Q11

11 The function f is given by $f(x) = 4 \cos^4 x + \cos^2 x - k$ for $0 \leq x \leq 2\pi$, where k is a constant.

(a) Given that $k = 3$, find the exact solutions of the equation $f(x) = 0$. [5]

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Topical questions | 99 questions

62. Question part 2/3 | 9709 May-June 2022 P1 V2 Q11

(b) Use the quadratic formula to show that, when $k > 5$, the equation $f(x) = 0$ has no solutions. [5]

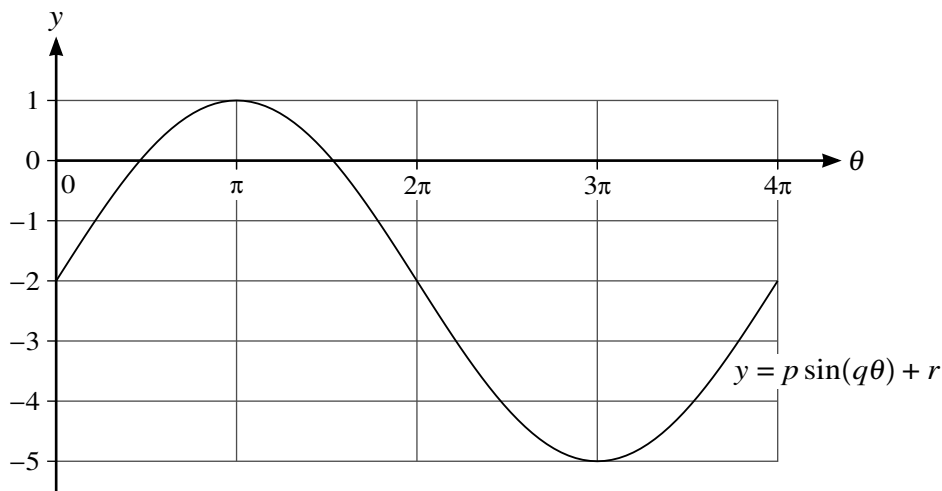
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If you use the following lined page to complete the answer(s) to any question(s), the question number(s) must be clearly shown.

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2



The diagram shows part of the curve with equation $y = p \sin(q\theta) + r$, where p , q and r are constants.

(a) State the value of p . [1]

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(b) State the value of q . [1]

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(c) State the value of r . [1]

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Topical questions | 99 questions

5 (a) Solve the equation $6\sqrt{y} + \frac{2}{\sqrt{y}} - 7 = 0$. [4]

[illegible]

(b) Hence solve the equation $6\sqrt{\tan x} + \frac{2}{\sqrt{\tan x}} - 7 = 0$ for $0^\circ \leq x \leq 360^\circ$. [3]

[illegible]

Topical questions | 99 questions

6 (a) Show that the equation

may be expressed in the form $a \sin^2 \theta + b \sin \theta + c = 0$, where a , b and c are constants to be found. [3]

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Topical questions | 99 questions

65. Question part 2/2 | 9709 Oct-Nov 2022 P1 V1 Q6

(b) Hence solve the equation $\frac{1}{\sin \theta + \cos \theta} + \frac{1}{\sin \theta - \cos \theta} = 1$ for $0^\circ \leq \theta \leq 360^\circ$. [3]

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Topical questions | 99 questions

3 (a) Find the set of values of k for which the equation $8x^2 + kx + 2 = 0$ has no real roots. [2]

[illegible]

- [illegible]

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Topical questions | 99 questions

67. Question part 1/2 | 9709 Oct-Nov 2022 P1 V2 Q7

7 (a) Prove the identity $\frac{\sin \theta}{\sin \theta + \cos \theta} + \frac{\cos \theta}{\sin \theta - \cos \theta} \equiv \frac{\tan^2 \theta + 1}{\tan^2 \theta - 1}$. [3]

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

Topical questions | 99 questions

[illegible]

9709 Mathematics Paper 1 - Trigonometry

Topical questions | 99 questions

68. Question | 9709 Oct-Nov 2022 P1 V3 Q1

1 Solve the equation $8 \sin^2 \theta + 6 \cos \theta + 1 = 0$ for $0^\circ < \theta < 180^\circ$.

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9709 Mathematics Paper 1 - Trigonometry

Topical questions | 99 questions

69. Question | 9709 Oct-Nov 2022 P1 V3 Q6

6 It is given that $\alpha = \cos^{-1}(\frac{8}{17})$.

Find, without using the trigonometric functions on your calculator, the exact value of $\frac{1}{\sin \alpha} + \frac{1}{\tan \alpha}$.
[5]

[illegible]

9709 Mathematics Paper 1 - Trigonometry

Topical questions | 99 questions

70. Question part 1/2 | 9709 Feb-March 2023 P1 V2 Q7

7 (a) By first obtaining a quadratic equation in $\cos \theta$, solve the equation

$$\tan \theta \sin \theta = 1$$

for $0^\circ < \theta < 360^\circ$.

[5]

[illegible]

9709 Mathematics Paper 1 - Trigonometry

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70. Question part 2/2 | 9709 Feb-March 2023 P1 V2 Q7

(b) Show that $\frac{\tan \theta}{\sin \theta} - \frac{\sin \theta}{\tan \theta} \equiv \tan \theta \sin \theta$.

[3]

[illegible]

9709 Mathematics Paper 1 - Trigonometry

Topical questions | 99 questions

71. Question | 9709 May-June 2023 P1 V1 Q1

1 Solve the equation $4 \sin \theta + \tan \theta = 0$ for $0^\circ < \theta < 180^\circ$.

[illegible]

72. Question | 9709 May-June 2023 P1 V1 Q7

7 A curve has equation $y = 2 + 3 \sin \frac{1}{2}x$ for $0 \leq x \leq 4\pi$.

(a) State greatest and least values of y . [2]

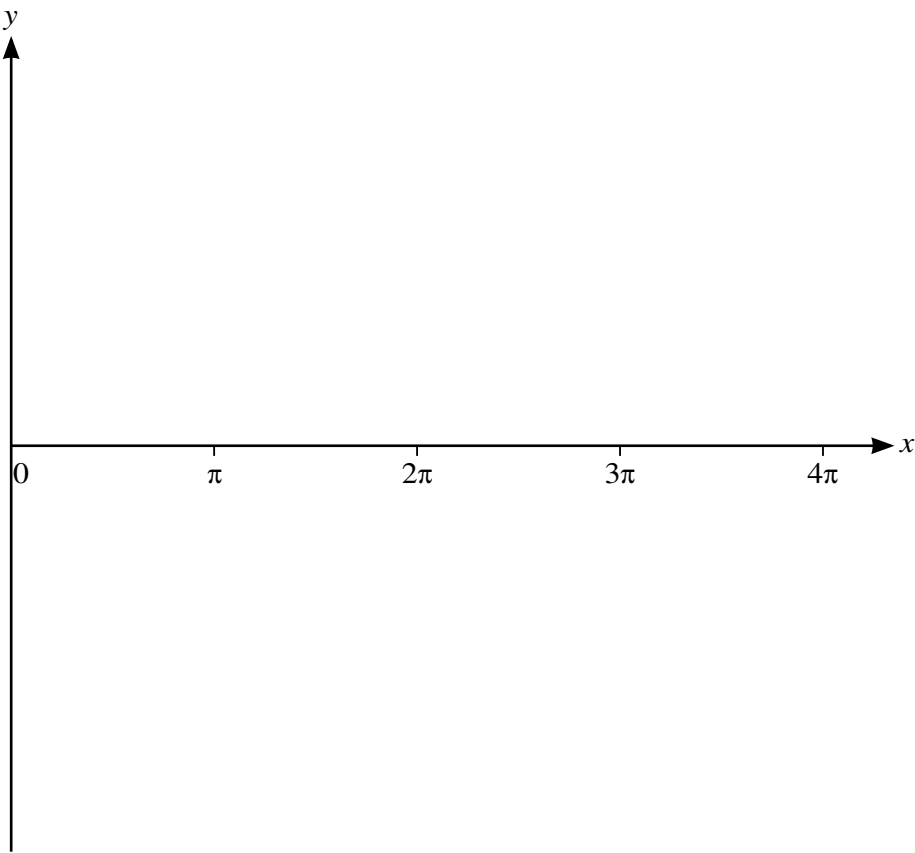
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(b) Sketch the curve. [2]



(c) State the number of solutions of the equation

$$2 + 3 \sin \frac{1}{2}x = 5 - 2x$$

for $0 \leq x \leq 4\pi$. [1]

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Topical questions | 99 questions

7 (a) (i) By first expanding $(\cos \theta + \sin \theta)^2$, find the three solutions of the equation

for $0 \leq \theta \leq \pi$. [3]

(ii) Hence verify that the only solutions of the equation $\cos \theta + \sin \theta = 1$ for $0 \leq \theta \leq \pi$ are 0 and $\frac{1}{2}\pi$. [2]

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Topical questions | 99 questions

73. Question part 2/2 | 9709 May-June 2023 P1 V2 Q7

[illegible]

$$\frac{\sin \theta}{\cos \theta + \sin \theta} + \frac{1 - \cos \theta}{\cos \theta - \sin \theta} = 2(\cos \theta + \sin \theta - 1)$$

[illegible]

Topical questions | 99 questions

4 (a) Show that the equation

may be expressed in the form $a \cos^4 x + b \cos^2 x + c = 0$, where a , b and c are constants to be found. [3]

[illegible][illegible]

9709 Mathematics Paper 1 - Trigonometry

Topical questions | 99 questions

75. Question | 9709 Oct-Nov 2023 P1 V1 Q5

5 (a) Show that the equation

$$4 \sin x + \frac{5}{\tan x} + \frac{2}{\sin x} = 0$$

may be expressed in the form $a \cos^2 x + b \cos x + c = 0$, where a , b and c are integers to be found. [3]

[illegible]

(b) Hence solve the equation $4 \sin x + \frac{5}{\tan x} + \frac{2}{\sin x} = 0$ for $0^\circ \leq x \leq 360^\circ$. [3]

[illegible]

9709 Mathematics Paper 1 - Trigonometry

Topical questions | 99 questions

76. Question | 9709 Oct-Nov 2023 P1 V2 Q2

2 Find the exact solution of the equation

$$\frac{1}{6}\pi + \tan^{-1}(4x) = -\cos^{-1}\left(\frac{1}{2}\sqrt{3}\right). \quad [2]$$

[illegible]

Topical questions | 99 questions

7 (a) Verify the identity $(2x - 1)(4x^2 + 2x - 1) \equiv 8x^3 - 4x + 1$. [1]

[illegible]

(b) Prove the identity $\frac{\tan^2 \theta + 1}{\tan^2 \theta - 1} \equiv \frac{1}{1 - 2 \cos^2 \theta}$. [3]

[illegible]

9709 Mathematics Paper 1 - Trigonometry

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77. Question part 2/2 | 9709 Oct-Nov 2023 P1 V2 Q7

(c) Using the results of (a) and (b), solve the equation

$$\frac{\tan^2 \theta + 1}{\tan^2 \theta - 1} = 4 \cos \theta,$$

for $0^\circ \leq \theta \leq 180^\circ$.

[5]

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Topical questions | 99 questions

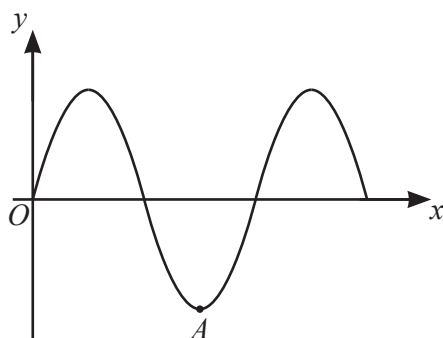
3 (a) Show that the equation

may be expressed in the form $a \cos^2 \theta + b \cos \theta + c = 0$, where a , b and c are constants to be found. [3]

[illegible]

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2



(a) State the coordinates of A . [1]

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Reflection in the x -axis

Find the equation of the new curve and determine the coordinates of the point on the new curve corresponding to A . [3]

[illegible]

Topical questions | 99 questions

4 (a) Prove that $\frac{(\sin \theta + \cos \theta)^2 - 1}{\cos^2 \theta} \equiv 2 \tan \theta$. [3]

This image shows a full page of white paper with horizontal dashed lines, typical of primary-ruled notebook paper. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

(b) Hence solve the equation $\frac{(\sin \theta + \cos \theta)^2 - 1}{\cos^2 \theta} = 5 \tan^3 \theta$ for $-90^\circ < \theta < 90^\circ$. [3]

This image shows a full page of white paper with horizontal dashed lines, typical of primary school handwriting practice paper. The lines are evenly spaced and run across the entire width of the page. There are no margins, text, or other markings present.

9709 Mathematics Paper 1 - Trigonometry

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81. Question | 9709 May-June 2024 P1 V1 Q5

5 (a) Prove the identity $\frac{\sin^2 x - \cos x - 1}{1 + \cos x} \equiv -\cos x$. [3]

This image shows a full page of white paper with horizontal dashed lines, typical of primary school writing paper. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

(b) Hence solve the equation $\frac{\sin^2 x - \cos x - 1}{2 + 2 \cos x} = \frac{1}{4}$ for $0^\circ \leq x \leq 360^\circ$. [3]

[illegible]

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82. Question | 9709 May-June 2024 P1 V2 Q3

- 3 (a)** Show that the equation $\frac{7 \tan \theta}{\cos \theta} + 12 = 0$ can be expressed as

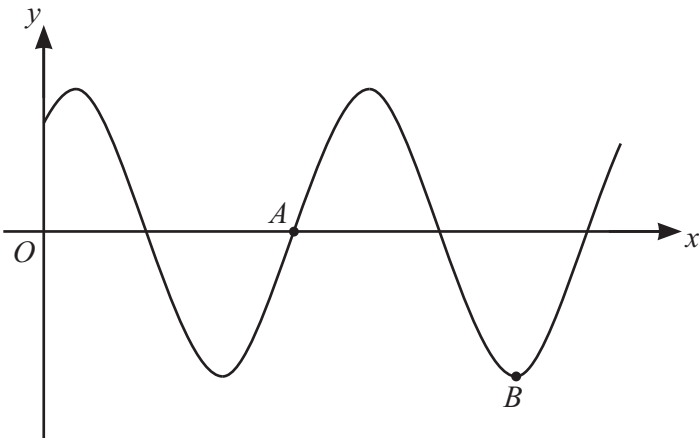
$$12 \sin^2 \theta - 7 \sin \theta - 12 = 0. \quad [3]$$

[illegible]

- (b)** Hence solve the equation $\frac{7 \tan \theta}{\cos \theta} + 12 = 0$ for $0^\circ \leq \theta \leq 360^\circ$. [3]

[illegible]

2 (a)



The diagram shows the curve $y = k \cos(x - \frac{1}{6}\pi)$ where k is a positive constant and x is measured in radians. The curve crosses the x -axis at point A and B is a minimum point.

Find the coordinates of A and B . [3]

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(b) Find the exact value of t that satisfies the equation

$$3 \sin^{-1}(3t) + 2 \cos^{-1}\left(\frac{1}{2}\sqrt{2}\right) = \pi.$$
 [2]

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Topical questions | 99 questions

4 (a) Show that the equation $\cos \theta (7 \tan \theta - 5 \cos \theta) = 1$ can be written in the form $a \sin^2 \theta + b \sin \theta + c = 0$, where a , b and c are integers to be found. [3]

[illegible][illegible]

84. Question part 2/2 | 9709 May-June 2024 P1 V3 Q4



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85. Question part 1/2 | 9709 Oct-Nov 2024 P1 V1 Q8

- 8 (a)** It is given that β is an angle between 90° and 180° such that $\sin \beta = a$.

Express $\tan^2 \beta - 3 \sin \beta \cos \beta$ in terms of a . [3]

[illegible]

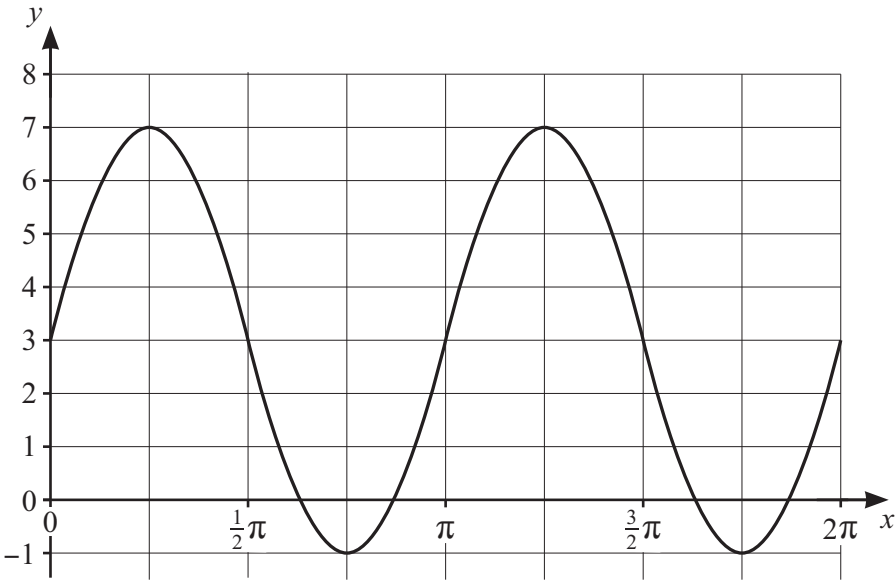
Topical questions | 99 questions



[5]

[illegible]

1



The diagram shows the curve with equation $y = a \sin(bx) + c$ for $0 \leq x \leq 2\pi$, where a , b and c are positive constants.

(a) State the values of a , b and c . [3]

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(b) For these values of a , b and c , determine the number of solutions in the interval $0 \leq x \leq 2\pi$ for each of the following equations:

(i) $a \sin(bx) + c = 7 - x$ [1]

.....

.....

(ii) $a \sin(bx) + c = 2\pi(x - 1)$. [1]

.....

.....

9709 Mathematics Paper 1 - Trigonometry

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87. Question | 9709 Oct-Nov 2024 P1 V3 Q2

2 Find the exact solution of the equation

$$\cos \frac{1}{6} \pi + \tan 2x + \frac{\sqrt{3}}{2} = 0 \text{ for } -\frac{1}{4} \pi < x < \frac{1}{4} \pi. \quad [2]$$

This image shows a full page of a handwriting practice worksheet. It consists of approximately 20 horizontal rows. Each row is defined by two parallel dotted lines, creating a series of uniform gaps for letter height. The entire page is otherwise blank, with no margins, text, or other markings.

9709 Mathematics Paper 1 - Trigonometry

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88. Question | 9709 Oct-Nov 2024 P1 V3 Q4

4 Solve the equation $4\sin^4\theta + 12\sin^2\theta - 7 = 0$ for $0^\circ \leq \theta \leq 360^\circ$. [4]

[illegible]

9709 Mathematics Paper 1 - Trigonometry

Topical questions | 99 questions

89. Question part 1/2 | 9709 Feb-March 2025 P1 V2 Q7

7 (a) Show that $3 \tan^2 \theta + 5 \sin^2 \theta \equiv \frac{8 \sin^2 \theta - 5 \sin^4 \theta}{1 - \sin^2 \theta}$. [3]

This image shows a full page of a handwriting practice worksheet. It consists of approximately 20 horizontal rows. Each row is defined by two parallel dotted lines, creating a series of uniform gaps for letter height. The entire page is otherwise blank, with no margins, text, or other markings.

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Topical questions | 99 questions

89. Question part 2/2 | 9709 Feb-March 2025 P1 V2 Q7



(b) Hence solve the equation $3 \tan^2 \theta + 5 \sin^2 \theta = 9$ for $0^\circ < \theta < 270^\circ$.

[4]

[illegible]

9709 Mathematics Paper 1 - Trigonometry

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90. Question | 9709 May-June 2025 P1 V1 Q1

1 Solve the equation $6 \sin \theta = 1 + \frac{2}{\sin \theta}$ for $-180^\circ < \theta < 180^\circ$. [4]

This image shows a full page of a handwriting practice worksheet. It consists of approximately 20 horizontal rows. Each row is defined by two parallel dotted lines, creating a series of uniform gaps for writing. The lines are evenly spaced across the entire page, providing a guide for letter height and placement. There is no text or other markings on the page.

[illegible]

A coordinate system with a horizontal x-axis and a vertical y-axis. The origin is labeled O . The x-axis has tick marks at $\frac{1}{2}\pi$, π , $\frac{3}{2}\pi$, and 2π . The y-axis is labeled y at the top. The x-axis is labeled x at the right end.

[illegible]

9709 Mathematics Paper 1 - Trigonometry

Topical questions | 99 questions

92. Question part 1/2 | 9709 May-June 2025 P1 V2 Q7

7 (a) Prove the identity $\frac{\tan \theta + 7}{\tan^2 \theta - 3} \equiv \frac{\sin \theta \cos \theta + 7 \cos^2 \theta}{1 - 4 \cos^2 \theta}$. [3]

[illegible]

Topical questions | 99 questions



(b) Hence solve the equation $\frac{\sin \theta \cos \theta + 7 \cos^2 \theta}{1 - 4 \cos^2 \theta} = \frac{5}{\tan \theta}$ for $0^\circ \leq \theta \leq 180^\circ$. [4]

[illegible]

9709 Mathematics Paper 1 - Trigonometry

Topical questions | 99 questions

93. Question | 9709 May-June 2025 P1 V3 Q5

5 Solve the equation

$$4 \sin \theta \tan \theta = 1 + 5 \cos \theta$$

for $-180^\circ < \theta < 180^\circ$.

[6]

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

Topical questions | 99 questions

3 (a) Use completing the square to find the exact solutions of the equation $4x^2 - 4x - 1 = 0$. [2]

This image shows a full page of white paper with horizontal dashed lines, typical of primary school handwriting practice paper. The lines are evenly spaced and run across the entire width of the page. There are no margins, text, or other markings present.

- [illegible]

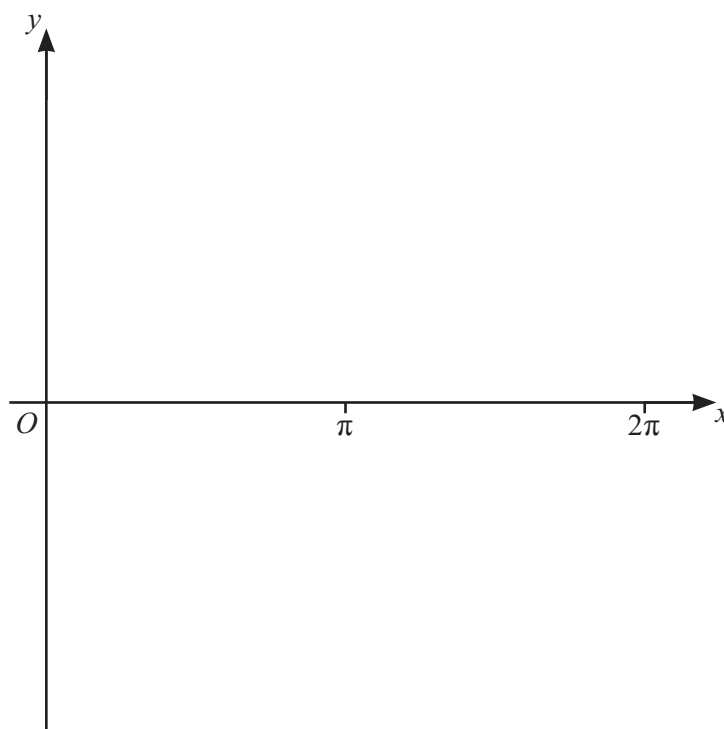
9

$$g(x) = 3 \cos(x - \pi) + 2 \text{ for } \pi \leq x \leq 2\pi$$

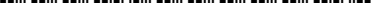
- [4]

This image shows a full page of white paper with horizontal dashed lines, typical of primary school handwriting practice paper. The lines are evenly spaced and run across the entire width of the page. There are no margins, text, or other markings present.

- [4]



Topical questions | 99 questions



[4]

This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting practice. There are no margins, text, or other markings on the page.

[1]

[illegible]

Topical questions | 99 questions

5 (a) Show that $\tan^4 \theta - 1 \equiv \frac{1 - 2 \cos^2 \theta}{\cos^4 \theta}$. [3]

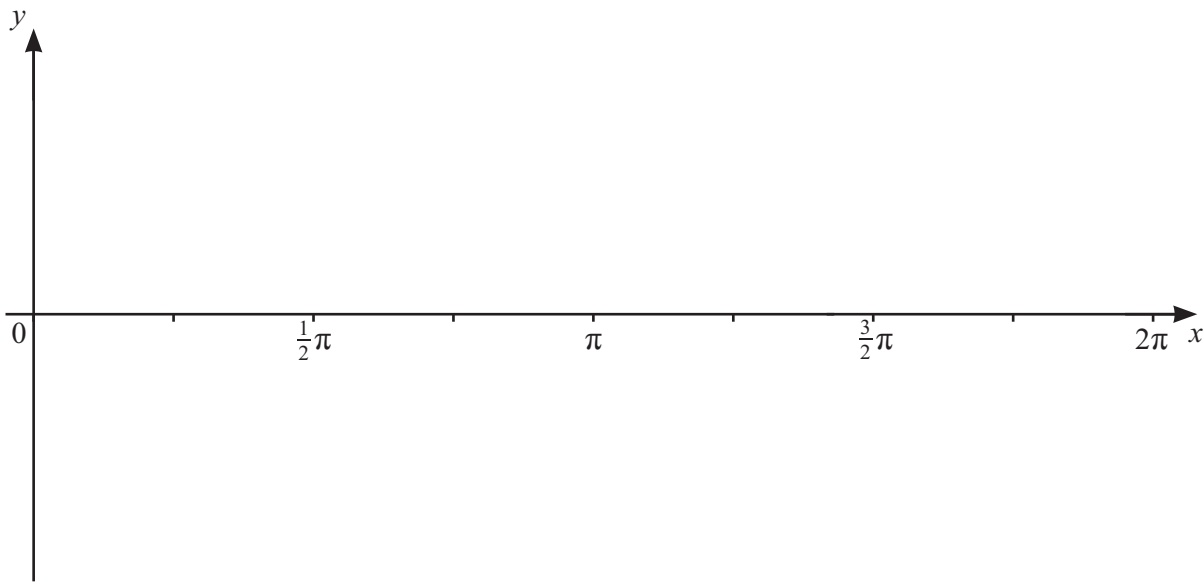
[illegible]

(b) Hence solve the equation $\cos^2\theta(\tan^4\theta - 1) = 7$ for $0^\circ < \theta < 180^\circ$. [4]

[illegible]

97. Question part 1/2 | 9709 Oct-Nov 2025 P1 V2 Q6

6 (a) Sketch the graph of $y = 3 \sin x + 2$ for $0 \leq x \leq 2\pi$. [2]



(b) Determine the number of solutions in the interval $0 \leq x \leq 2\pi$ of each of the following equations.

(i) $3 \sin x + 2 = x$ [1]

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(ii) $3 \sin x + 2 = 5 - x$ [1]

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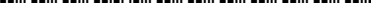
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Topical questions | 99 questions



[5]

[illegible]

9709 Mathematics Paper 1 - Trigonometry

Topical questions | 99 questions

98. Question | 9709 Oct-Nov 2025 P1 V3 Q2

2 (a) Solve the equation $\tan^{-1}(5x-3) = -\frac{1}{4}\pi$. [2]

[illegible]

(b) Solve the equation $5 \cos^2 \theta = 4 \sin \theta + 4$ for $\frac{1}{2}\pi \leq \theta \leq 2\pi$. [4]

[illegible]

9709 Mathematics Paper 1 - Trigonometry

Topical questions | 99 questions

99. Question part 1/2 | 9709 Oct-Nov 2025 P1 V5 Q6

6 (a) Show that the equation

$$6 \sin \theta + \frac{1}{\tan \theta} = \frac{4}{\sin \theta}$$

can be written in the form

$$6 \cos^2 \theta - \cos \theta - 2 = 0. \quad [3]$$

This image shows a full page of a handwriting practice worksheet. It consists of multiple sets of three horizontal dotted lines spaced evenly down the page, providing a guide for letter height and placement. The background is plain white, and there are no other markings or text present.

9709 Mathematics Paper 1 - Trigonometry

Topical questions | 99 questions

99. Question part 2/2 | 9709 Oct-Nov 2025 P1 V5 Q6



(b) Hence, solve the equation

$$6 \sin \theta + \frac{1}{\tan \theta} = \frac{4}{\sin \theta}$$

for $0^\circ \leq \theta \leq 360^\circ$.

[4]

[illegible]