Trigonometric Equations and Identities - Edexcel Past Exam Questions

1. (*a*) Show that the equation

$$5 \cos^2 x = 3(1 + \sin x)$$

can be written as

$$5 \sin^2 x + 3 \sin x - 2 = 0.$$

(2)

(*b*) Hence solve, for $0 \leq x < 360°$, the equation

$$5 \cos^2 x = 3(1 + \sin x),$$

giving your answers to 1 decimal place where appropriate. **(5)**

Jan 05 Q4

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2. Solve, for $0 \leq x \leq 180°$, the equation

(*a*) $\sin(x + 10°) = \frac{\sqrt{3}}{2}$, **(4)**

(*b*) $\cos 2x = -0.9$, giving your answers to 1 decimal place. **(4)**

June 05 Q5

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3. (*a*) Find all the values of θ, to 1 decimal place, in the interval $0° \leq \theta < 360°$ for which

$$5 \sin(\theta + 30°) = 3.$$

(4)

(*b*) Find all the values of θ, to 1 decimal place, in the interval $0° \leq \theta < 360°$ for which

$$\tan^2 \theta = 4.$$

(5)

Jan 06 Q8

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4. (*a*) Given that $\sin\theta = 5\cos\theta$, find the value of $\tan\theta$. **(1)**

(*b*) Hence, or otherwise, find the values of θ in the interval $0 \le \theta < 360°$ for which

$$\sin\theta = 5\cos\theta,$$

giving your answers to 1 decimal place. **(3)**

June 06 Q6

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5. (*a*) Show that the equation

$$3\sin^2\theta - 2\cos^2\theta = 1$$

can be written as

$$5\sin^2\theta = 3.$$ **(2)**

(*b*) Hence solve, for $0° \le \theta < 360°$, the equation

$$3\sin^2\theta - 2\cos^2\theta = 1,$$

giving your answer to 1 decimal place. **(7)**

Jan 08 Q4

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6. Solve, for $0 \le x < 360°$,

(*a*) $\sin(x - 20°) = \dfrac{1}{\sqrt{2}}$, **(4)**

(*b*) $\cos 3x = -\dfrac{1}{2}$. **(6)**

June 08 Q9

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7. (*a*) Show that the equation

$$4\sin^2 x + 9\cos x - 6 = 0$$

can be written as

$$4\cos^2 x - 9\cos x + 2 = 0.$$ **(2)**

(*b*) Hence solve, for $0 \le x < 720°$,

$$4\sin^2 x + 9\cos x - 6 = 0,$$

giving your answers to 1 decimal place. **(6)**

Jan 09 Q8

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8. (i) Solve, for $-180° \leq \theta < 180°$,

$$(1 + \tan\theta)(5\sin\theta - 2) = 0.$$

(4)

(ii) Solve, for $0 \leq x < 360°$,

$$4\sin x = 3\tan x.$$

(6)

June 09 Q7

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9. (*a*) Show that the equation

$$5\sin x = 1 + 2\cos^2 x$$

can be written in the form

$$2\sin^2 x + 5\sin x - 3 = 0.$$

(2)

(*b*) Solve, for $0 \leq x < 360°$,

$$2\sin^2 x + 5\sin x - 3 = 0.$$

(4)

Jan 10 Q2

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10. (*a*) Given that $5\sin\theta = 2\cos\theta$, find the value of $\tan\theta$.

(1)

(*b*) Solve, for $0 \leq x < 360°$,

$$5\sin 2x = 2\cos 2x,$$

giving your answers to 1 decimal place.

(5)

June 10 Q5

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11. (*a*) Show that the equation

$$3\sin^2 x + 7\sin x = \cos^2 x - 4$$

can be written in the form

$$4\sin^2 x + 7\sin x + 3 = 0.$$

(2)

(*b*) Hence solve, for $0 \leq x < 360°$,

$$3\sin^2 x + 7\sin x = \cos^2 x - 4$$

giving your answers to 1 decimal place where appropriate.

(5)

Jan 11 Q7

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12. Solve for $0 \leq x < 360°$, giving your answers in degrees to 1 decimal place,

$$3\sin(x + 45°) = 2.$$

(4)

June 11 Q7*(edited)*

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13. a) Find the solutions for the equation $\mathbf{cos(sin(\boldsymbol{x}))} = \frac{1}{2}$ in the interval $\mathbf{0} \leq \boldsymbol{x} \leq \mathbf{180}$.

b) Find the solutions for the equation $\mathbf{sin(cos(\boldsymbol{x}))} = \frac{1}{2}$ in the interval $\mathbf{0} \leq \boldsymbol{x} \leq \mathbf{180}$.