Trigonometry - Past Edexcel Exam Questions

1.

7. (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 $0 \leqslant x < 360°$,

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

giving your answers to 1 decimal place where appropriate.

(5)

Question 7 - January 2011

2.

7. (a) Solve for $0 \leqslant x < 360°$, giving your answers in degrees to 1 decimal place,

$$3\sin(x + 45°) = 2$$

(4)

(b) Find, for $0 \leqslant x < 2\pi$, all the solutions of

$$2\sin^2 x + 2 = 7\cos x$$

giving your answers in radians.

You must show clearly how you obtained your answers.

(6)

Question 7 - June 2011

3.

9. (i) Find the solutions of the equation $\sin(3x-15°)=\frac{1}{2}$, for which $0 \leqslant x \leqslant 180°$

(6)

(ii)

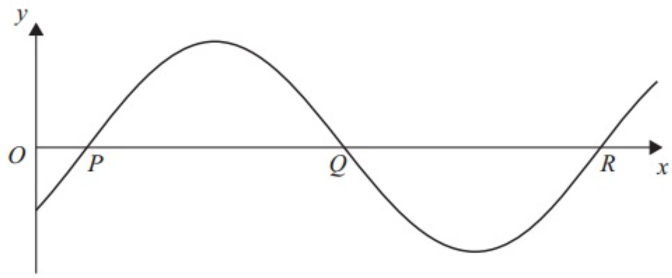

Figure 4

Figure 4 shows part of the curve with equation

$$y=\sin(ax-b), \text{ where } a>0,\ 0<b<\pi$$

The curve cuts the x-axis at the points P, Q and R as shown.

Given that the coordinates of P, Q and R are $\left(\frac{\pi}{10}, 0\right)$, $\left(\frac{3\pi}{5}, 0\right)$ and $\left(\frac{11\pi}{10}, 0\right)$ respectively, find the values of a and b.

(4)

Question 9 - January 2012

4.

6. (a) Show that the equation

$$\tan 2x = 5 \sin 2x$$

can be written in the form

$$(1 - 5 \cos 2x) \sin 2x = 0$$

(2)

(b) Hence solve, for $0 \leqslant x \leqslant 180°$,

$$\tan 2x = 5 \sin 2x$$

giving your answers to 1 decimal place where appropriate.
You must show clearly how you obtained your answers.

(5)

Question 6 - June 2012

5.

4. Solve, for $0 \leqslant x < 180°$,

$$\cos(3x - 10°) = -0.4$$

giving your answers to 1 decimal place. You should show each step in your working.

(7)

Question 4 - January 2013

6.

8. (i) Solve, for $-180° \leqslant x < 180°$,

$$\tan(x - 40°) = 1.5$$

giving your answers to 1 decimal place.

(3)

(ii) (a) Show that the equation

$$\sin\theta \tan\theta = 3\cos\theta + 2$$

can be written in the form

$$4\cos^2\theta + 2\cos\theta - 1 = 0$$

(3)

(b) Hence solve, for $0 \leqslant \theta < 360°$,

showing each stage of your working.

(5)

Question 8 - June 2013

7.

7. (i) Solve, for $0 \leqslant \theta < 360°$, the equation

$$9\sin(\theta + 60°) = 4$$

giving your answers to 1 decimal place.
You must show each step of your working.

(4)

(ii) Solve, for $-\pi \leqslant x < \pi$, the equation

$$2\tan x - 3\sin x = 0$$

giving your answers to 2 decimal places where appropriate.
[*Solutions based entirely on graphical or numerical methods are not acceptable.*]

(5)

Question 7 - June 2014

8.

8. (i) Solve, for $0 \leqslant \theta < \pi$, the equation

$$\sin 3\theta - \sqrt{3}\cos 3\theta = 0$$

giving your answers in terms of π.

(3)

(ii) Given that

$$4\sin^2 x + \cos x = 4 - k, \qquad 0 \leqslant k \leqslant 3$$

(a) find $\cos x$ in terms of k.

(3)

(b) When $k = 3$, find the values of x in the range $0 \leqslant x < 360°$

(3)

Question 8 - June 2015

9.

6. (i) Solve, for $-\pi < \theta \leqslant \pi$,

$$1 - 2\cos\left(\theta - \frac{\pi}{5}\right) = 0$$

giving your answers in terms of π.

(3)

(ii) Solve, for $0 \leqslant x < 360°$,

$$4\cos^2 x + 7\sin x - 2 = 0$$

giving your answers to one decimal place.
(*Solutions based entirely on graphical or numerical methods are not acceptable.*)

(6)

Question 6 - June 2016

Solutions

1. (a) -
   (b) 228.59°, 270°, 311.41°
2. (a) 93.2°, 356.8°
   (b) $\frac{\pi}{3}$, $\frac{5\pi}{3}$
3. $a = 2$, $b = \frac{\pi}{5}$
4. (a) -
   (b) 39.2°, 140.8°, 0°, 180°, 360°.
5. 41.2°, 85.5°, 161.2°
6. (a) 96.3°, −83.7°
   (b) i. -
      ii. 72°, 144°, 216°, 288°
7. (a) 93.6°, 326.4°
   (b) −3.13, −0.84, 0, −0.84
8. (a) $\frac{\pi}{9}$, $\frac{4\pi}{9}$, $\frac{7\pi}{9}$
   (b) $\cos(x) = \frac{1}{8} \pm \sqrt{\frac{1}{64} + \frac{k}{4}}$
   (c) 0°, 139°, 221°
9. (a) $\frac{8\pi}{15}$, $\frac{-2\pi}{15}$
   (b) 345.5°, 194.5°