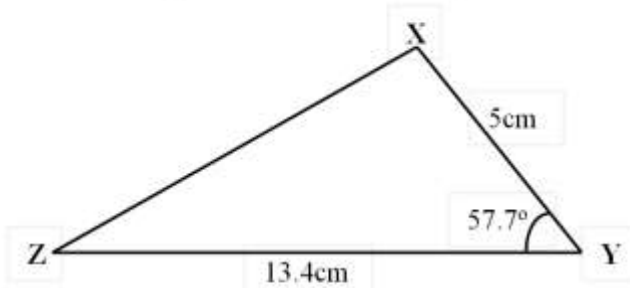


# TRIGONOMETRY II KCSE QUESTIONS WITH ANSWERS MODEL27042023 PDF

- 1 Given that in triangle XYZ,  $YZ = 13.4$  cm,  $XY = 5$  cm and  $\angle XYZ = 57.7^\circ$ , find;



- a) The length XZ (2 Marks)  
b) The circum radius of the triangle (2 Marks)

2

Solve for  $\theta$  in the equation  $\sin(3\theta + 120)^\circ = \frac{\sqrt{3}}{2}$  for  $0^\circ \leq \theta \leq 180^\circ$ . (3mks)

3 Given that  $\sin 2x = \cos(3x - 10^\circ)$ , find  $\tan x$ , correct to 4 significant figures.

4 Given that  $\cos 2x^\circ = 0.8070$ , find  $x$  when  $0^\circ < x < 360^\circ$  (4 marks)

5 Solve the equation  $\sin(\frac{1}{2}x - 30^\circ) = \cos x$  for  $0^\circ < x < 90^\circ$ .

6 Give that  $x^\circ$  is an angle in the first quadrant such that  $8\sin 2x + 2\cos x - 5 = 0$   
Find:

- a)  $\cos x$
- b)  $\tan x$

7 Give the equation:  $\sin(3x + 30^\circ) = \sqrt{3}$ , for  $0^\circ \leq x \leq 90^\circ$

8

Without using a calculator or mathematical tables, express

$$\frac{\sqrt{3}}{1 - \cos 30^\circ} \text{ in surd form and simplify}$$

9 Solve the equation:

$$2\cos 2\theta = 1 \text{ for } 0^\circ \leq \theta \leq 360^\circ$$

## TRIGONOMETRY II MARKING SCHEME

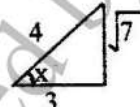
1	<p>a) <math>xz^2 = 13.4^2 + 5^2 - 2 \times 13.4 \times 5 \cos 57.7</math></p> <p style="margin-left: 20px;"><math>= 179.56 + 25 - 71.6</math></p> <p style="margin-left: 20px;"><math>= 132.96</math></p> <p style="margin-left: 20px;"><math>xz = 11.53 \text{cm}</math></p> <p>b) <math>2r = \frac{11.53}{\sin 57.7}</math></p> <p style="margin-left: 20px;"><math>r = 6.82 \text{cm}</math></p>	<p>M1</p>    <p>A1</p> <p>M1</p> <p>A1</p>
		04

2	<p><math>\sin(3\theta + 120) = \frac{\sqrt{3}}{2}</math></p> <p style="margin-left: 20px;"><math>3\theta + 120 = 60, 120, 420, 480</math></p> <p style="margin-left: 20px;"><math>3\theta + 120 = 120</math></p> <p><math>\theta = 0^\circ</math></p> <p>Or <math>3\theta + 120 = 420</math></p> <p style="margin-left: 20px;"><math>\theta = 100^\circ</math></p> <p>Or <math>3\theta + 120 = 480^\circ</math></p> <p style="margin-left: 20px;"><math>\theta = 120^\circ</math></p>	<p>M1</p>          <p>A1</p>          <p>A1</p>
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3	<p><math>\sin 2x = \cos(3x - 10)</math></p> <p style="margin-left: 20px;"><math>2x + (3x - 10) = 90</math></p> <p style="margin-left: 20px;"><math>5x - 10 = 90</math></p> <p style="margin-left: 20px;"><math>5x = 100</math></p> <p style="margin-left: 20px;"><math>x = 20^\circ</math></p> <p style="margin-left: 20px;"><math>\tan 20^\circ = 0.3640</math></p>	<p>M1</p>          <p>A1</p>          <p>B1</p>
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4	<p>9. <math>\cos 2x^\circ = 0.870</math></p> <p style="margin-left: 20px;"><math>2x^\circ = 36.2, 143.8, 216.2</math></p> <p style="margin-left: 20px;"><math>323.8, 396.2, 503.8,</math></p> <p style="margin-left: 20px;"><math>576.2, 683.8</math></p> <p style="margin-left: 20px;">Hence <math>x^\circ = 18.1, 71.9, 108.1, 161.9</math></p> <p style="margin-left: 20px;"><math>198.1, 251.9, 288.1, 341.9</math></p>	<p>B1</p> <p>M1</p>    <p>M1</p>    <p>A1</p>
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5	$\sin\left(\frac{1}{2}x - 30\right) = \sin(90 - x)$	
	$\frac{1}{2}x - 30 = 90 - x$	M1
	$x = 80^\circ$	A1
		2

6	9. $8(1 - \cos 2x) + 2 \cos x - 5 = 0$	M1	(substitution)
	$8 \cos x - 2 \cos x - 3 = 0$	M1	or $(2p + 1)(4p - 3) = 0$ M1
	$(2 \cos x + 1)(4 \cos x - 3) = 0$	A1	Disqualify $\cos x = -1/2$
	$\cos x = 3/4$		
	$\tan x = \frac{\sqrt{7}}{3}$	B1	$x = 41.412$
		4	41.4 or 41.42 or 41
	$(\tan 41.41) = 0.8519$		$\tan x = 0.8819$ B1
	$(\tan 41.4) = 0.9316$		$\tan 41.42 = 0.8822$
			$\tan 41^\circ.25' = 0.8821$

7	$\sin(3x + 30) = \sin 60^\circ$	B1	for $60^\circ$
	$\sin(3x + 30) = \sin 120^\circ$	B1	for $120^\circ$
	$3x + 30 = 60$		
	$3x + 30 = 120$		
	$x = 10^\circ, x = 30^\circ$	B1	for $10^\circ$
		B1	for $30^\circ$
		04	

8	$\frac{\sqrt{3}}{1 - \cos 30^\circ} = \frac{\sqrt{3}}{1 - \sqrt{3}/2}$	B1	For $\cos 30^\circ = \sqrt{3}/2$ in the expression
	$= \frac{2\sqrt{3} - (2 + \sqrt{3})}{(2\sqrt{3})(2 + \sqrt{3})}$	M1	(Rationalization)
	$= \frac{2\sqrt{3}(2 + \sqrt{3})}{4 - 3}$	A1	
	$= 4\sqrt{3} + 6$	3	

9	$2 \cos 2\theta = 1$	
	$\cos 2\theta = 1/2$	
	$\therefore 2\theta = 60^\circ, 300^\circ, 420^\circ, 660^\circ$	B1 B1
	$\theta = 30^\circ, 150^\circ, 210^\circ, 330^\circ$	B1 B1
		4