Further Pure Maths: Radians and Trigonometry: Test Pack

Total Marks

EDEXCEL 4PM1 · Calculator allowed · about 15 minutes

Name: _____ Date: ____ / ____ / _____

Show your working. Use radians or degrees as stated in each question. Give exact answers unless a degree of accuracy is specified. Questions marked non-calculator should be attempted without a calculator. Accept equivalent exact forms and valid alternative methods for the corresponding marks.

1 Convert 135 degrees to radians and 7*π/6 radians to degrees. Give exact answers.

(Total for Question 1 is 2 marks)

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2 In triangle ABC, angle BAC = 35 degrees, BC = 8 cm and AC = 11 cm. There are two possible triangles. Find both possible values of angle ABC to 1 decimal place and the corresponding lengths AB to 3 significant figures. Pair each angle with its length.

(Total for Question 2 is 5 marks)

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3 A sector has radius 8 cm and angle 5*π/8 radians at its centre. Find its exact area.

(Total for Question 3 is 2 marks)

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4 Prove the identity $(1 - \cos(x)^2)/\sin(x) = \sin(x)$, for every x for which the left-hand side is defined. State the excluded values of x in radians.

(Total for Question 4 is 3 marks)

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Mark scheme · Further Pure Maths: Radians and Trigonometry: Test Pack

Question 1

$3*\pi/4$ radians; accept equivalent exact forms.	**B1**
210 degrees.	**B1**

Answer: $3*\pi/4$ radians; 210 degrees

Question 2

Use sin(B) = 11*sin(35 degrees)/8.	**M1**
Both B values: 52.1 degrees and 127.9 degrees to 1 decimal place.	**A1**
Use C = 180 - 35 - B and AB = 8*sin(C)/sin(35 degrees) for the two cases, retaining unrounded values.	**M1**
Pair B = 52.1 degrees with AB = 13.9 cm to 3 significant figures.	**A1**
Pair B = 127.9 degrees with AB = 4.09 cm to 3 significant figures; accept valid alternative methods.	**A1**

Answer: ABC = 52.1 degrees, AB = 13.9 cm; ABC = 127.9 degrees, AB = 4.09 cm

Question 3

Use area = $(1/2)*r^2*\theta$.	**M1**
$20*\pi$ cm^2; accept equivalent exact forms.	**A1**

Answer: $20*\pi$ cm^2

Question 4

Replace $1 - \cos(x)^2$ by $\sin(x)^2$ using the Pythagorean identity.	**M1**
Cancel a factor sin(x) to obtain sin(x), on the stated domain; accept any valid proof.	**A1**
Exclude $x = k*\pi$ for every integer k.	**B1**

Answer: sin(x); excluded values $x = k*\pi$ for any integer k

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