HIGHER

3.2 The Sine Rule, Cosine Rule and Area of a Triangle: 10-minute Pack

Total Marks

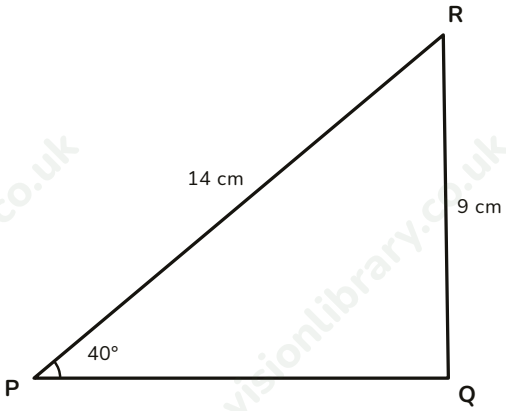
EDEXCEL 4MA1 · Calculator allowed · about 10 minutes

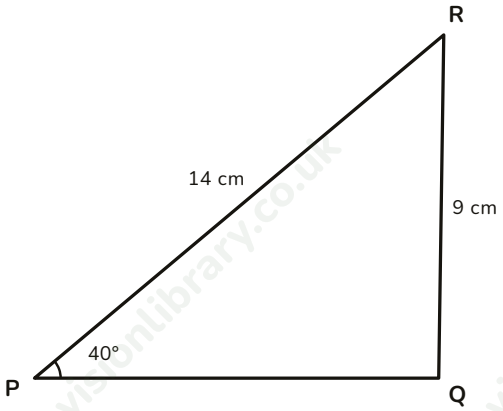
Name: _____ Date: ____ / ____ / _____

Show full working for multi-step questions. Write answers in clear sentences for questions where a reason is asked. Suggested time 10 minutes.

1 Triangle PQR has sides p = QR = 9 cm, q = RP = 14 cm and angle P = 40 degrees. Calculate the possible lengths r = PQ, correct to 2 decimal places, using the cosine rule.

Diagram NOT accurately drawn

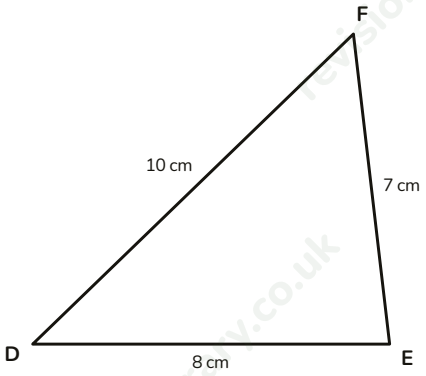




(Total for Question 1 is 3 marks)

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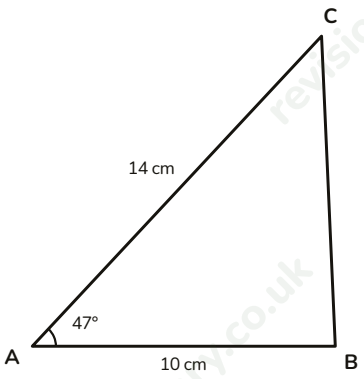
2 Triangle DEF has sides DE = 8 cm, EF = 7 cm and DF = 10 cm. Use the cosine rule to find angle E (the angle at vertex E between DE and EF), giving the answer to the nearest degree.



(Total for Question 2 is 2 marks)

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3 Triangle ABC has sides AB = 10 cm, AC = 14 cm and angle A = 47 degrees. First use the cosine rule to find BC to 2 decimal places, then find the area of triangle ABC to 1 decimal place using 1/2 ab sin C (you will need an appropriate angle).



(Total for Question 3 is 3 marks)

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Mark scheme · 3.2 The Sine Rule, Cosine Rule and Area of a Triangle: 10-minute Pack

Question 1

uses $9^2 = 14^2 + r^2 - 28*r*\cos 40$ and rearranges to $r^2 - 28*\cos 40*r + 115 = 0$	**M1**
solves the quadratic using $r = 14*\cos 40 \pm \sqrt{196*\cos^2(40) - 115}$	**M1**
both possible lengths r = 10.86 cm or 10.59 cm to 2 decimal places, cao	**A1**

Answer: r = 10.86 cm or 10.59 cm

Question 2

uses $\cos E = (DE^2 + EF^2 - DF^2) / (2*DE*EF)$ with correct substitution	**M1**
E = 83 degrees (nearest degree), cao	**A1**

Answer: E = 83 degrees

Question 3

uses cosine rule to find $BC^2 = AB^2 + AC^2 - 2*AB*AC*\cos A$ with correct substitution	**M1**
evaluates BC to 2 dp correctly	**M1**
uses area formula with two sides and included angle (e.g. 1/2 * AB * AC * sin A) and gives area to 1 dp correctly	**A1**

Answer: BC = 10.25 cm (to 2 dp), Area = 51.2 cm^2 (to 1 dp)

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