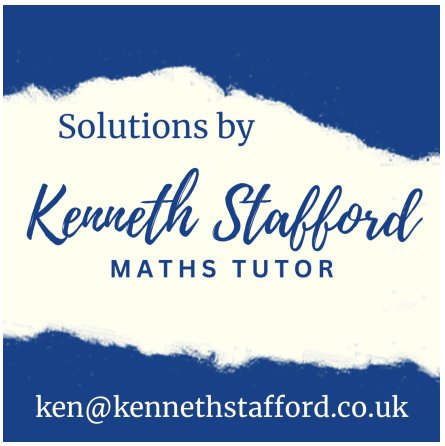
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GCSE (1 - 9)

Angles in Polygons



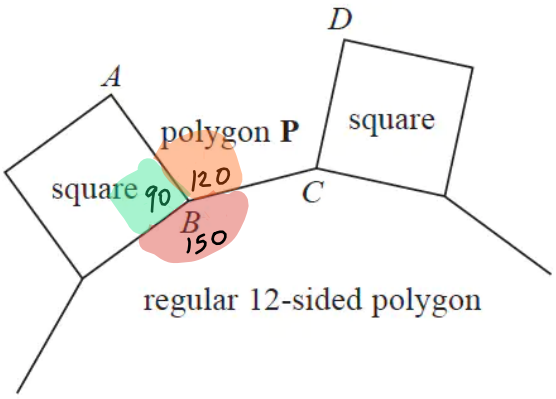


These questions are compiled from *released* Pearson Edexcel GCSE maths exam papers
They contain exam questions from up until the ***Summer 2023*** exam series
More recent exam papers do exist but are withheld for mock exams
As new exam papers are released these worksheets will gradually be updated
The ***most current*** version of these worksheets will always be available at: kennethstafford.co.uk

Question	Where the question appeared
1	Edexcel, GCSE, Summer 2017, Paper 3F, Q19
2	Edexcel, GCSE, Summer 2018, Paper 3F, Q26
3	Edexcel, GCSE, Autumn 2018, Paper 1F, Q28
4	Edexcel, GCSE, Summer 2019, Paper 3F, Q28
5	Edexcel, GCSE, Autumn 2019, Paper 3F, Q29
6	Edexcel, GCSE, Autumn 2020, Paper 2F, Q28
7	Edexcel, GCSE, Autumn 2020, Paper 3F, Q11
8	Edexcel, GCSE, Summer 2022, Paper 1F, Q27
9	Edexcel, GCSE, Summer 2022, Paper 1F, Q27
10	Edexcel, GCSE, Summer 2022, Paper 2F, Q7

1

In the diagram, AB, BC and CD are three sides of a regular polygon **P**.



12 sided polygon

exterior $= \frac{360}{12} = 30°$

interior $= 180 - 30 = 150°$

Show that polygon **P** is a hexagon.
You must show your working.

Interior angle of a square $= 90°$

Angles around a point sum to $360°$

Interior angle of polygon P $= 360 - (90 + 150) = 120°$

Interior angle of a hexagon is $120°$

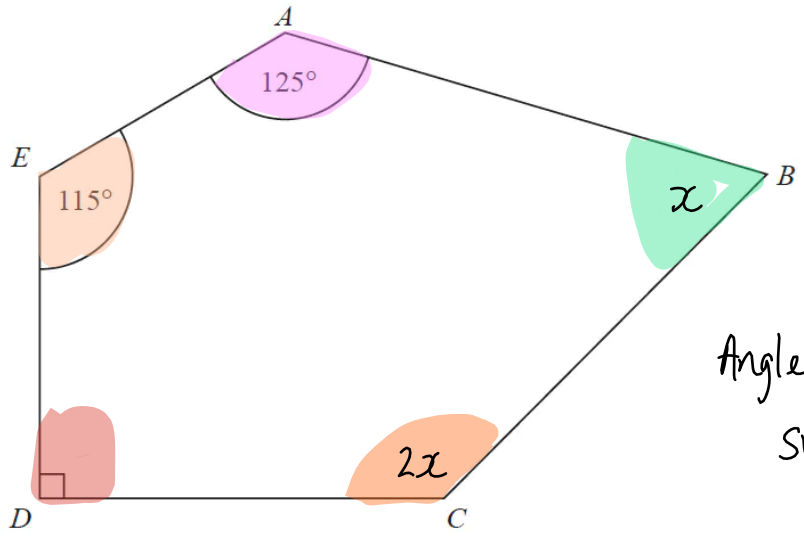
So Polygon P is a hexagon.

(Total for Question 19 is 4 marks)

[Edexcel, GCSE, Summer 2017, Paper 3F, Q19]

2

ABCDE is a pentagon.



Angles in a pentagon sum to 540°

Angle *BCD* = 2 × angle *ABC*

Work out the size of angle *BCD*.
You must show all your working.

$x + 2x + 90 + 115 + 125 = 540°$

$3x + 330 = 540$

$3x = 210$

$x = 70$

$BCD = 2x = 2 \times 70$

$= 140$

140 °

(Total for Question 26 is 5 marks)

[Edexcel, GCSE, Summer 2018, Paper 3F, Q26]

3

The size of each interior angle of a regular polygon is 11 times the size of each exterior angle.

Work out how many sides the polygon has.

Interior = $11x$

Exterior = x

Interior + exterior = 180

$11x + x = 180$

$12x = 180$

$x = \frac{180}{12} = 15$

Exterior = $\frac{360}{n}$

$n = \frac{360}{\text{exterior}}$

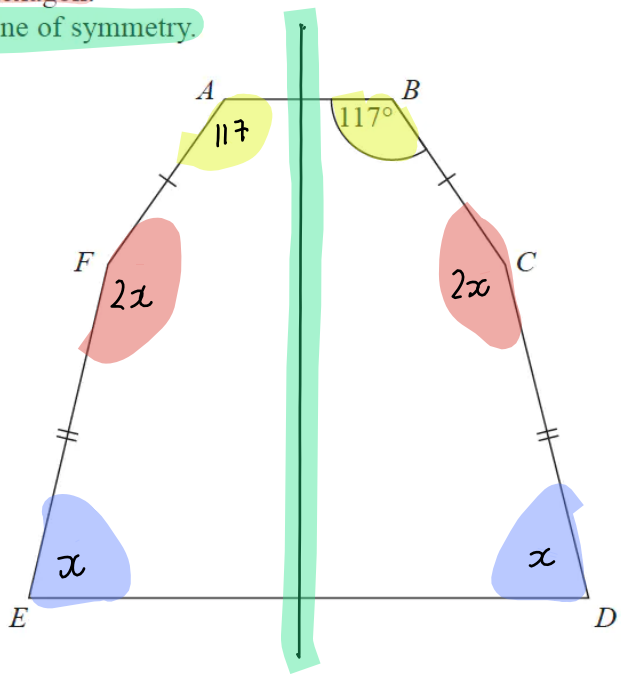
$n = \frac{360}{15} =$ 24 sides

(Total for Question 28 is 3 marks)

[Edexcel, GCSE, Autumn 2018, Paper 1F, Q28]

4

The diagram shows a hexagon.
The hexagon has one line of symmetry.



$FA = BC$
$EF = CD$
Angle $ABC = 117°$

Angle $BCD = 2 \times$ angle CDE

Work out the size of angle AFE.
You must show all your working.

Angles in a hexagon sum to 720°

$x + x + 2x + 2x + 117 + 117 = 720$

$6x + 234 = 720$

$6x = 486$

$x = \frac{486}{6}$

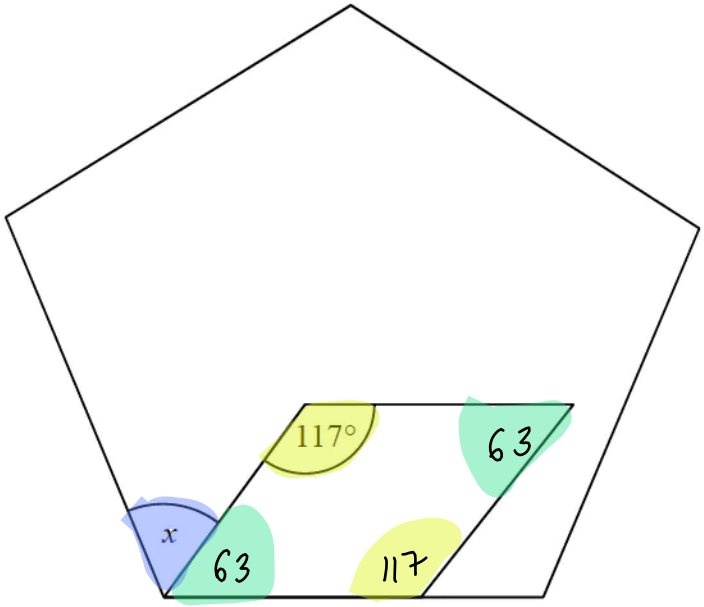
$AFE = 2 \times 81 = 162°$

(Total for Question 28 is 4 marks)

[Edexcel, GCSE, Summer 2019, Paper 3F, Q28]

5

The diagram shows a regular pentagon and a parallelogram.



Work out the size of the angle marked x.
You must show all your working.

Angles in a pentagon sum to 540°

Interior angle = $\frac{540}{5}$ = 108°

$63 + x = 108°$

$x = 108 - 63$

$x = 45°$

(Total for Question 29 is 4 marks)

[Edexcel, GCSE, Autumn 2019, Paper 3F, Q29]

6

Each exterior angle of a regular polygon is 15°

Work out the number of sides of the polygon.

exterior angle = 360 / no. of sides

no. of sides = 360 / exterior angle = 360 / 15 = 24

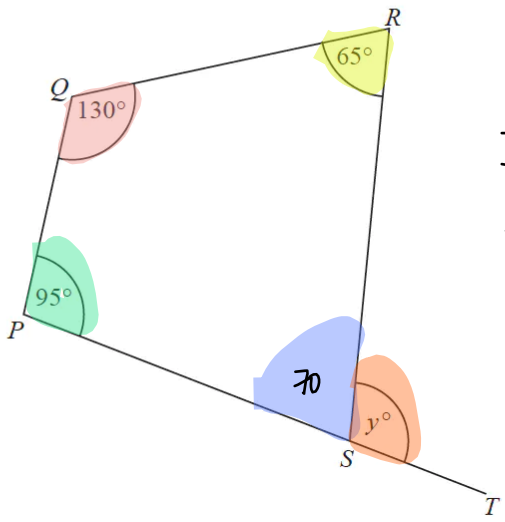
.....

(Total for Question 28 is 2 marks)

[Edexcel, GCSE, Autumn 2020, Paper 2F, Q28]

7

PQRS is a quadrilateral.
PST is a straight line.



130 + 65 + 95 = 290

360 − 290 = 70

y = 180 − 70 = 110°

Find the value of *y*.

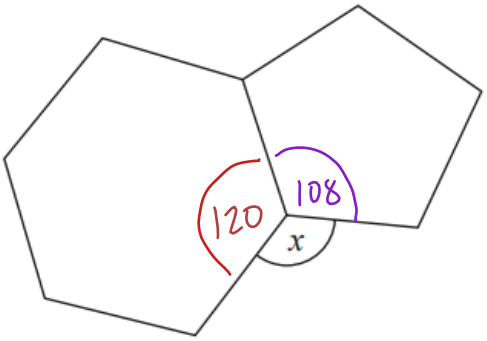
y = ...

(Total for Question 11 is 3 marks)

[Edexcel, GCSE, Autumn 2020, Paper 3F, Q11]

8

Here is a regular hexagon and a regular pentagon.



120 + 108 = 228

Work out the size of the angle marked x.
You must show all your working.

360 - 228 = 132°

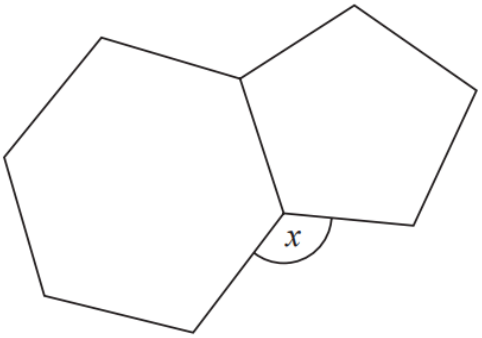
132 °

(Total for Question 5 is 3 marks)

[Edexcel, GCSE, Summer 2022, Paper 1F, Q27]

9

Here is a regular hexagon and a regular pentagon.



Work out the size of the angle marked x.
You must show all your working.

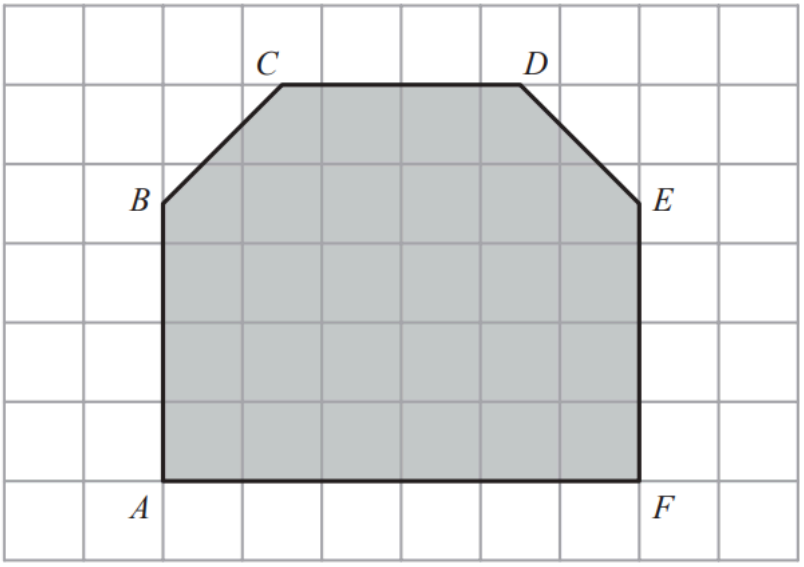
.....°

(Total for Question 27 is 3 marks)

[Edexcel, GCSE, Summer 2022, Paper 1F, Q27]

10

Here is polygon $ABCDEF$ on a square grid.



(a) Write down the mathematical name of the polygon.

.....

(1)

(b) Which side of the polygon is parallel to the side CD?

.....

(1)

(c) Write down a side of the polygon that is perpendicular to the side AF.

.....

(1)

(Total for Question 7 is 3 marks)

[Edexcel, GCSE, Summer 2022, Paper 2F, Q7]