THIRD SPACE LEARNING

GCSE Exam Questions

Polygons | Geometry & Measure

GCSE Exam Questions: Polygons

1) **(a)** Calculate the external angle for a regular icosagon.

(2)

(b) The external angle for a polygon is equal to 22.5°.

How many sides does the polygon have?

(2)

(4 marks)

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2) **(a)** Which of the following polygons have parallel sides.

Circle all that apply.

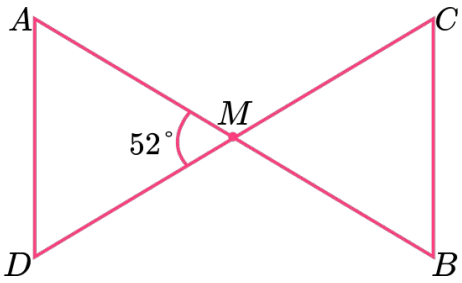
Regular Pentagon Trapezium Regular Octagon Kite

(2)

(b) ABCD is a complex polygon where AM = MB and CM:MD = 1:1.

Does the following polygon have parallel sides?

Explain your answer.

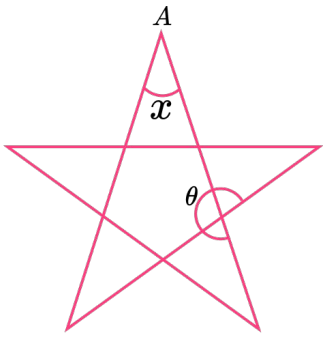


(5)

(7 marks)

GCSE Exam Questions: Polygons

3) **(a)** A pentagram is a complex pentagon made up of 5 isosceles triangles and a regular pentagon. If the interior angle at point A is equal to x, write an expression for the size of angle θ?



(1)

(b) Given that $\theta = 252°$, calculate the size of angle x.

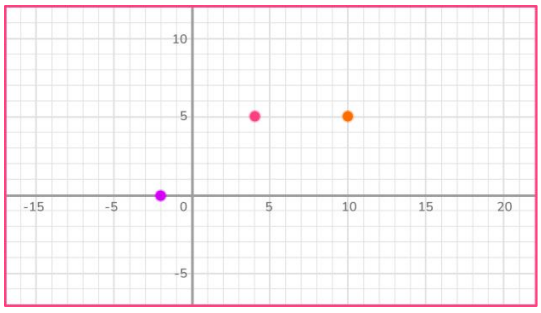
(1)

(2 marks)

4) **(a)** The angles in a polygon are given as:
$4x + 20$, $5x + 19$, $3x + 32$, $6x + 18$, $2x + 41$, and $5x - 10$.
By finding the value of x, classify the polygon.

(6)

(b) The set of axes below has three coordinates plotted:
A(-2, 0), B(4, 5), and C(10, 5).

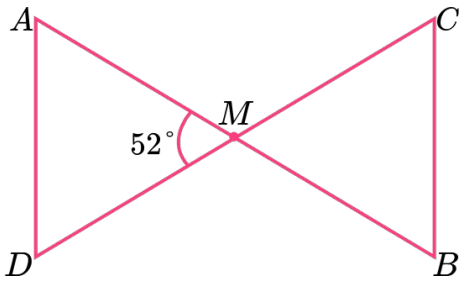
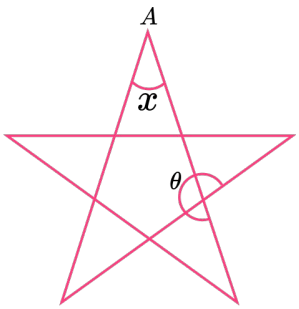


State the coordinates of the two points that would make an isosceles trapezium.

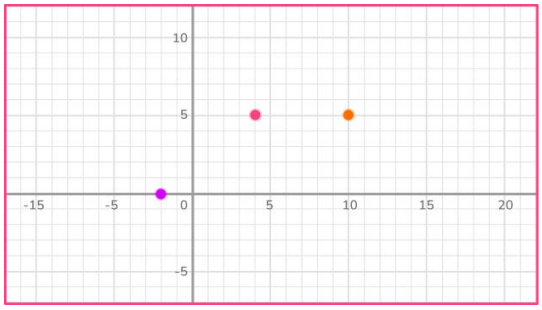
(2)

(8 marks)

GCSE Exam Questions: Polygons Answers

	Question	Answer	Marks
1) (a)	Calculate the external angle for a regular icosagon.	**(a)** 20 sides $360 \div 20 = 18^o$	**(1)** **(1)**
(b)	The external angle for a polygon is equal to 22.5°. How many sides does the polygon have?	**(b)** $360 \div 22.5$ 16 sides	**(1)** **(1)**
2) (a)	Which of the following polygons have parallel sides. Circle your answers. Regular Pentagon Trapezium Regular Octagon Kite	**(a)** Trapezium Regular Octagon	**(1)** **(1)**
(b)	$ABCD$ is a complex polygon where $AM = MB$ and $CM:MD = 1:1$. Does the following polygon have parallel sides? Explain your answer. 	**(b)** Vertically opposite angles are the same so angle $CMB = 52°$. As $AM = MB$ and $CM:MD = 1:1$, the lengths of AM, CM, BM, and DM are all equal so triangles AMD and CMB are both isosceles, and congruent (SAS). Angle ABC = angle DAM = $(180 - 52) \div 2 = 64^o$ As alternate angles are equal, AD is parallel to BC. Yes	**(1)** **(1)** **(1)** **(1)** **(1)**
3) (a)	A pentagram is a complex pentagon made up of 5 isosceles triangles and a regular pentagon. If the interior angle at point A is equal to x, write an expression for the size of angle θ? 	**(a)** $288 - x$ or $270 - \frac{x}{2}$	**(1)**
(b)	Given that $\theta = 252°$, calculate the size of angle x.	**(b)** $288 - 252 = 36°$ or $270 - \frac{x}{2} = 252$ $\frac{x}{2} = 18$ $x = 36°$	**(1)**

GCSE Exam Questions: Polygons Answers

	Question	Answer	Marks
4) (a)	The angles in a polygon are given as: $4x + 20$, $5x + 19$, $3x + 32$, $6x + 18$, $2x + 41$, and $5x - 10$. By finding the value of x, classify the polygon.	**(a)** $180(6 - 2) = 720°$ $4x + 20 + 5x + 19 + 3x + 32 + 6x + 18 + 2x + 41 + 5x - 10 = 720$ $x = 24°$ $4x + 20 = 116°$ $3x + 32 = 104°$ $5x + 19 = 139°$ $6x + 18 = 162°$ $2x + 41 = 89°$ $5x - 10 = 110°$ For minimum 3 correct angles All angles correct Irregular Hexagon	**(1)** **(1)** **(1)** **(1)** **(1)** **(1)**
(b)	The set of axes below has three coordinates plotted: $A(-2, 0)$, $B(4, 5)$, and $C(10, 5)$.  State the coordinates of the two points that would make an isosceles trapezium.	**(b)** (16,0) (- 2,- 6)	**(1)** **(1)**

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