

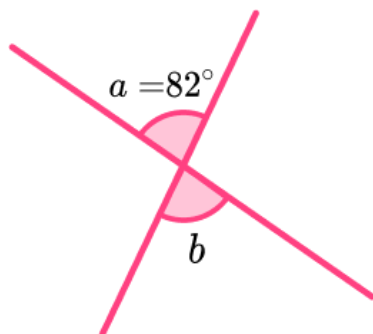
Vertically Opposite Angles - Worksheet

Skill

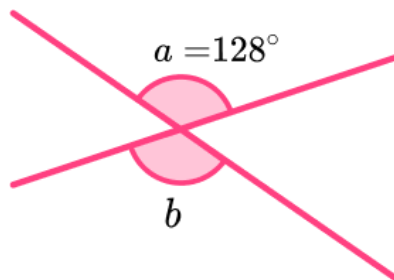
Group A - Two angles that are vertically opposite

Find the missing angles:

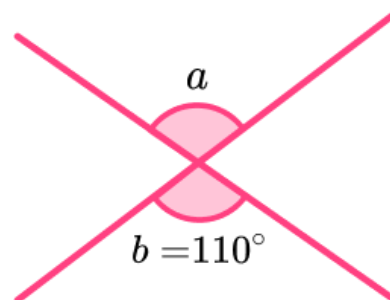
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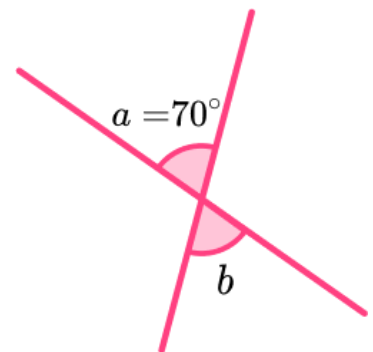
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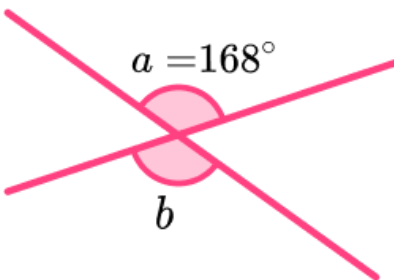
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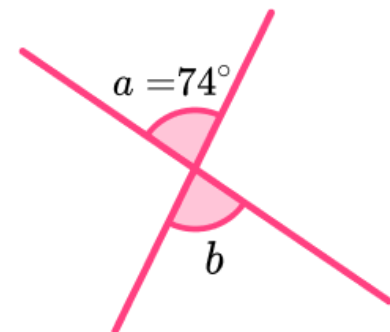
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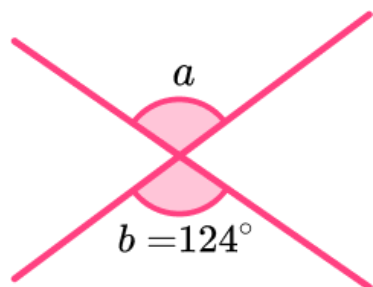
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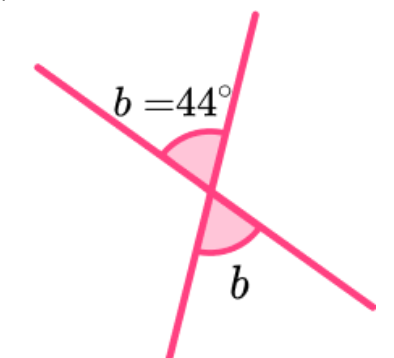
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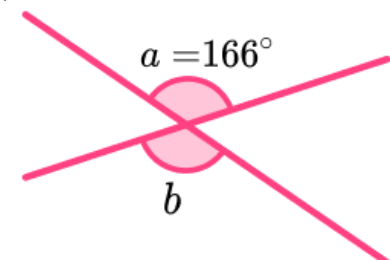
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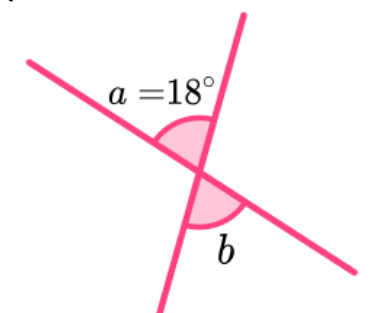
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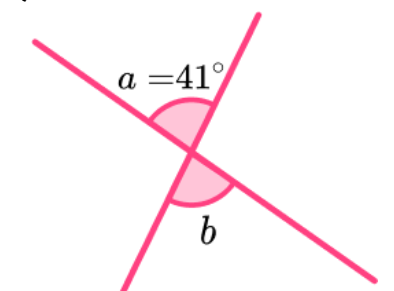
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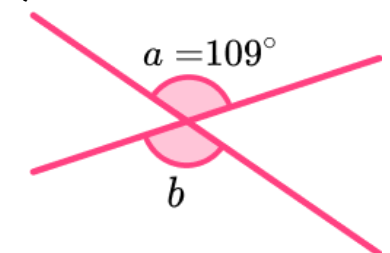
10)



11)



12)

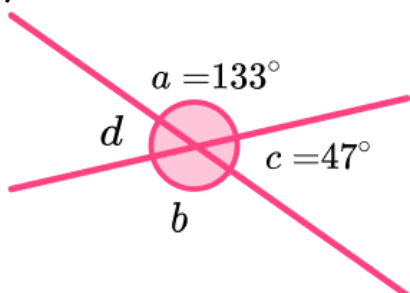


Vertically Opposite Angles - Worksheet

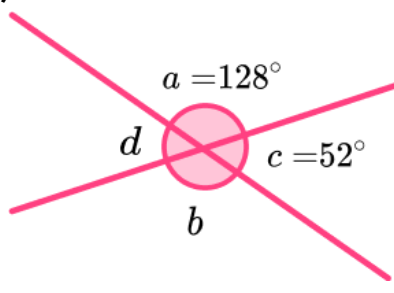
Group B - Vertically opposite angles around a point

Find the missing angles:

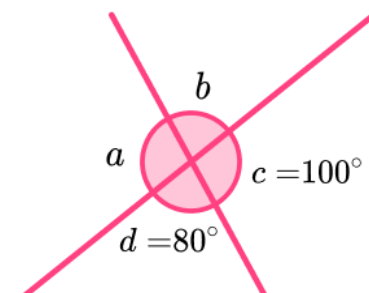
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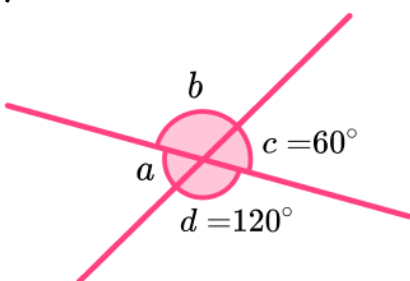
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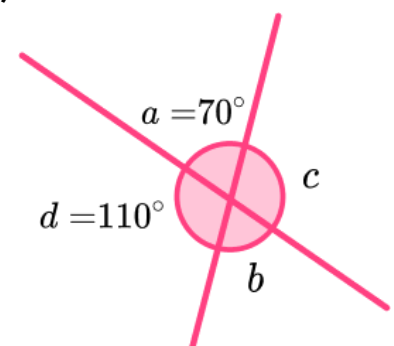
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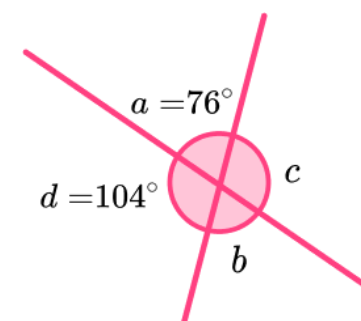
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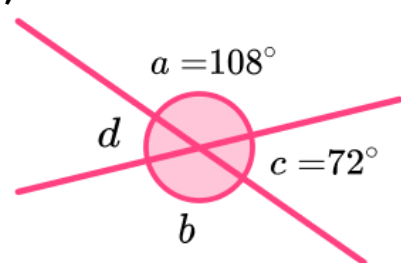
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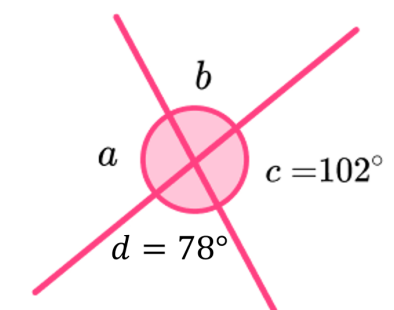
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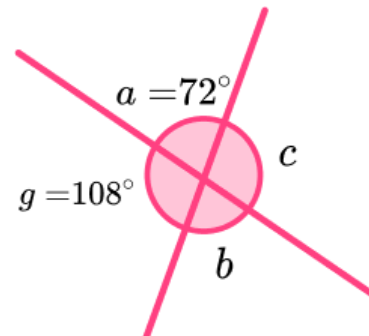
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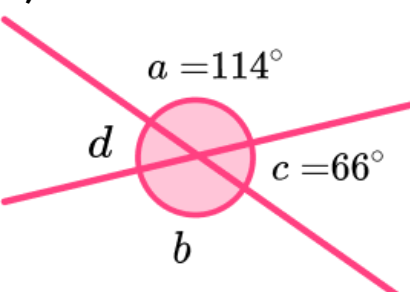
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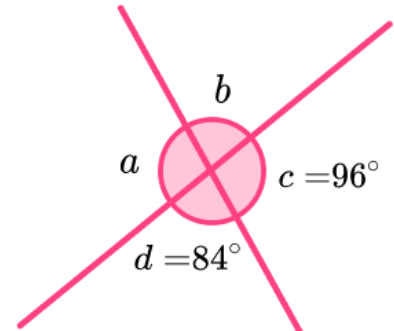
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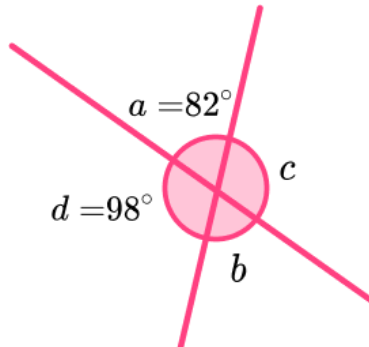
10)



11)



12)

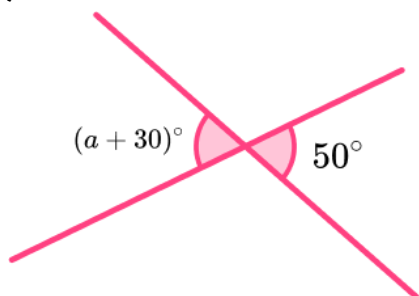


Vertically Opposite Angles - Worksheet

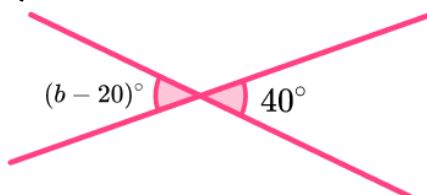
Group C - Algebraic vertically opposite angles

Find the unknown variable in each question:

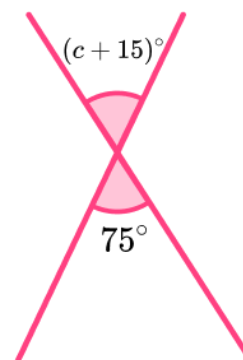
1)



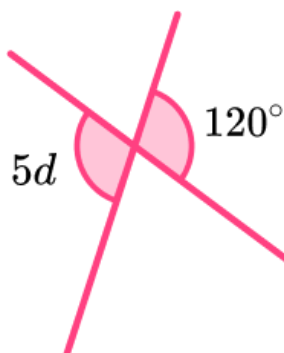
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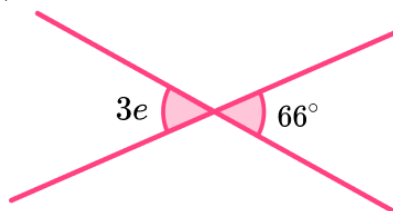
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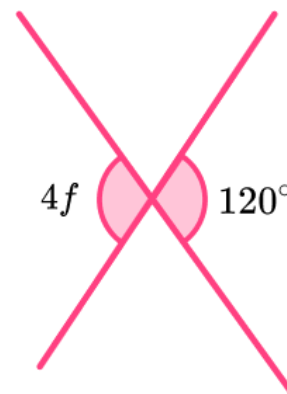
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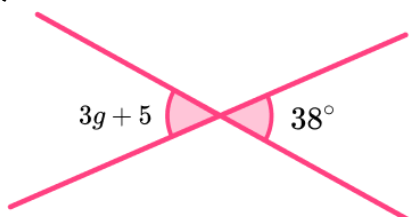
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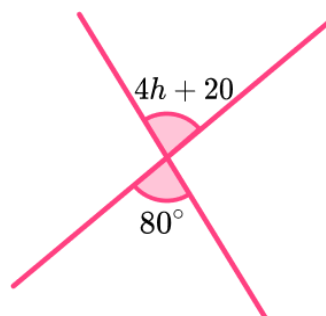
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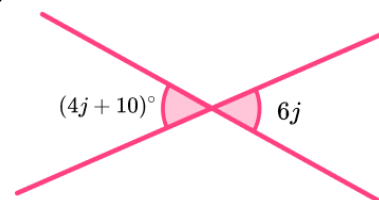
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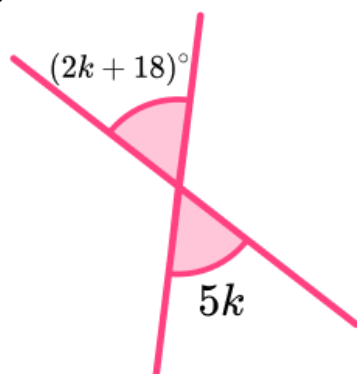
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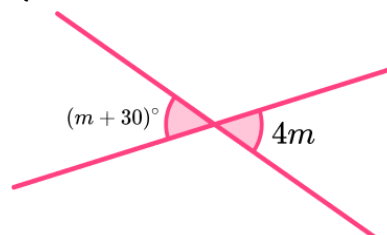
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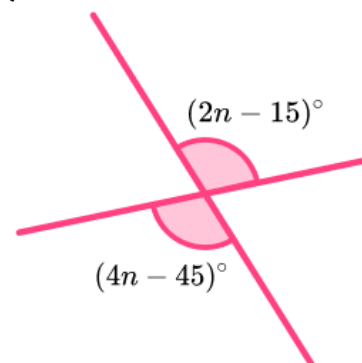
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11)



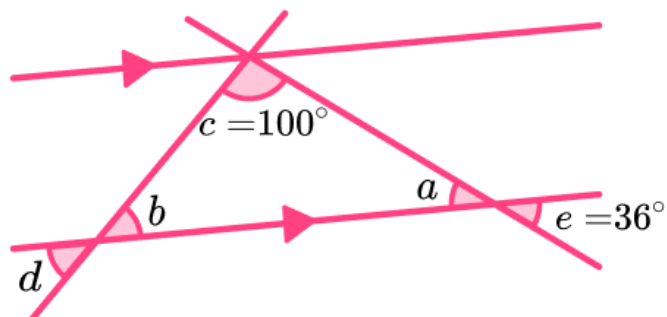
12)



Vertically Opposite Angles - Worksheet

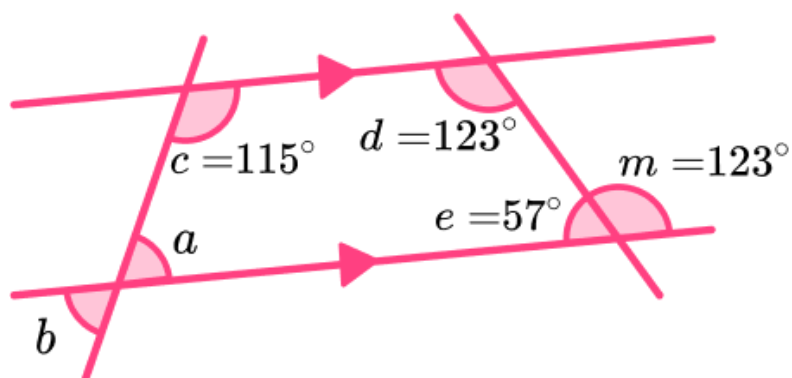
Applied

- 1) Find the missing angles a , b , and d .



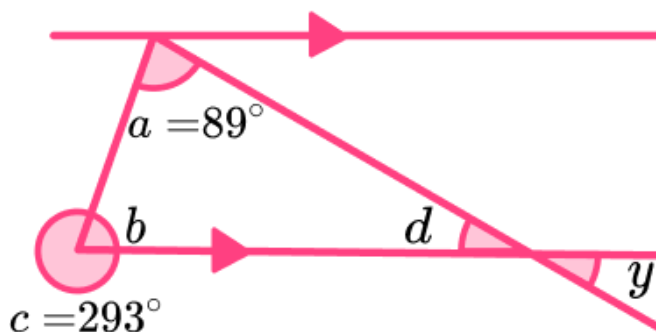
Give reasons for your answers.

- 2) Find the missing angles a and b .



Give reasons for your answers.

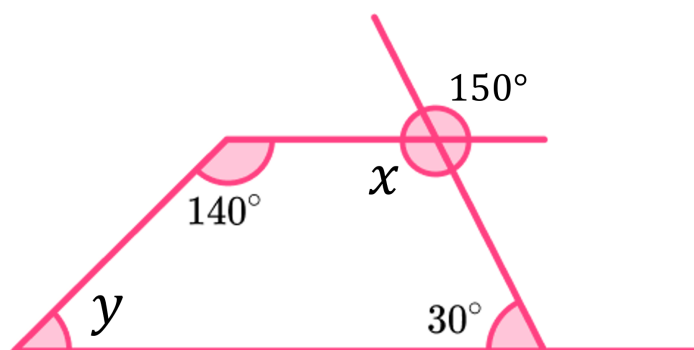
- 3) Find the missing angles b , d , and y .



Give reasons for your answers.

Vertically Opposite Angles - Exam Questions

- 1) (a) Use information in the diagram below to find the value of x .
Give a reason for your answer.



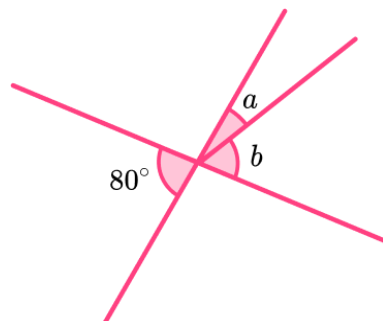
.....
(2)

- (b) Determine the value of y . State any angle facts used.

.....
(3)
(5 marks)

Vertically Opposite Angles - Exam Questions

- 2) Angle b is three times the size of angle a .



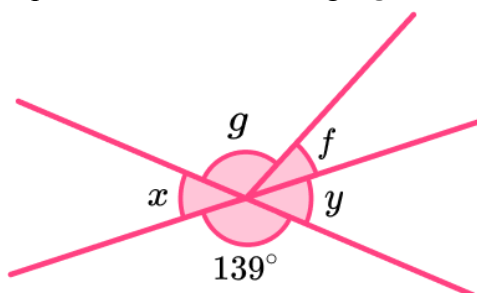
Work out the size of angle a and angle b .

$a = \dots\dots\dots$

$b = \dots\dots\dots$

(3 marks)

- 3) Angle f is one quarter of the size of angle g .

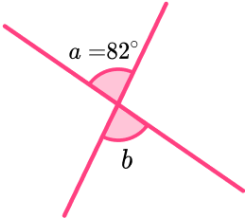
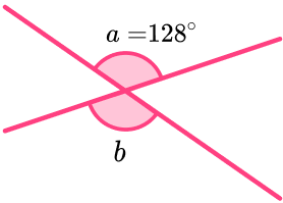
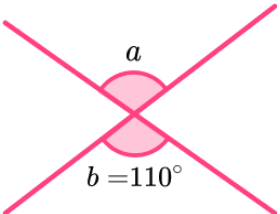
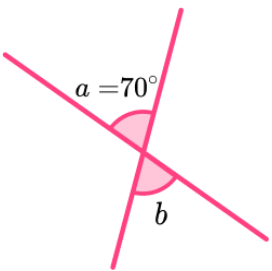
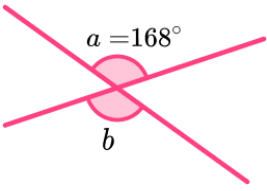
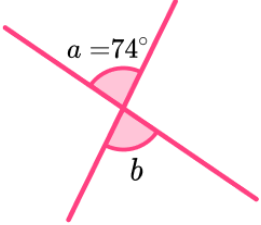


Bob thinks angle f is 28° . Is Bob correct? Explain why.

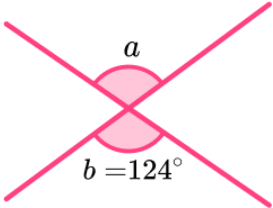
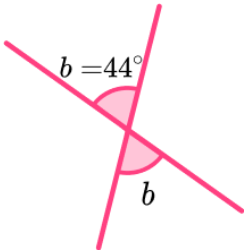
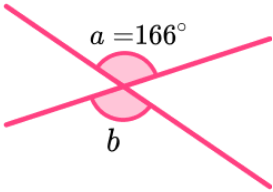
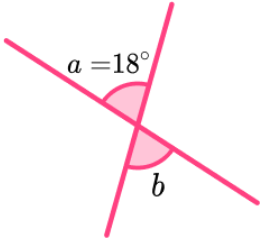
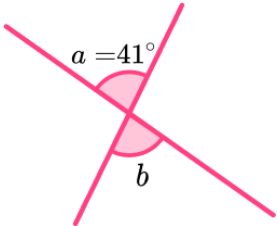
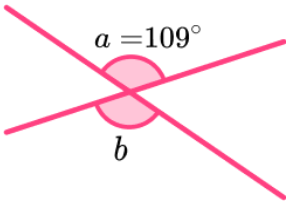
$\dots\dots\dots$

(5 marks)

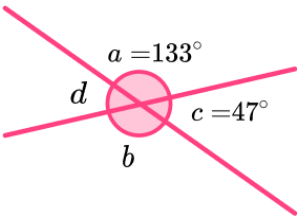
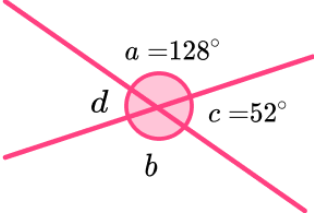
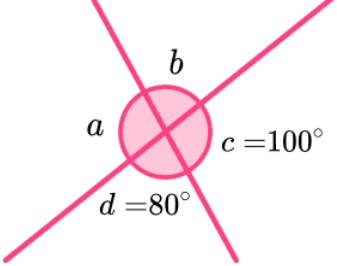
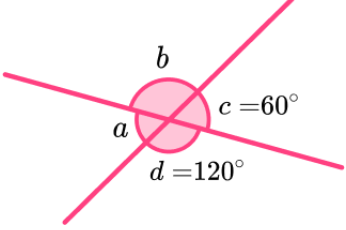
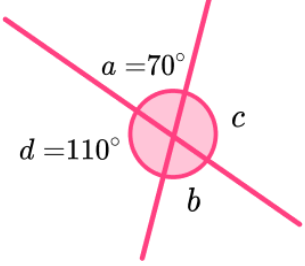
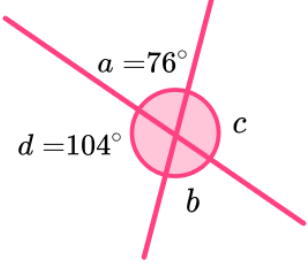
Vertically Opposite Angles - Answers

	Question	Answer
	Skill Questions	
Group A	Find the missing angles: 1)  2)  3)  4)  5)  6) 	1) 82° 2) 128° 3) 110° 4) 70° 5) 160° 6) 74°

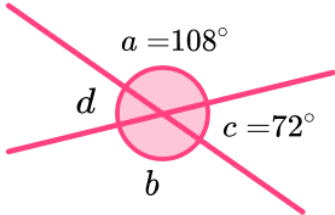
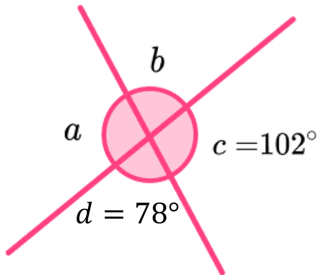
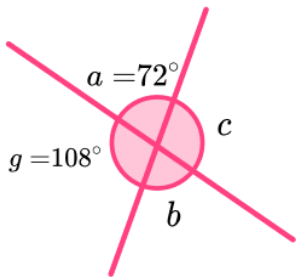
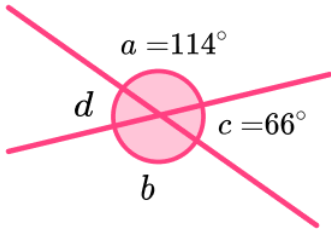
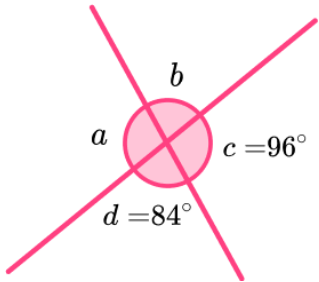
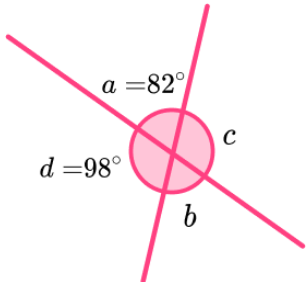
Vertically Opposite Angles - Answers

Group A contd	7) 	7) 124°
	8) 	8) 44°
	9) 	9) 166°
	10) 	10) 18°
	11) 	11) 41°
	12) 	12) 109°

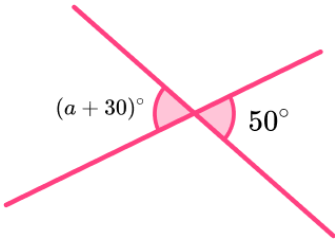
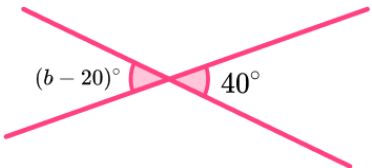
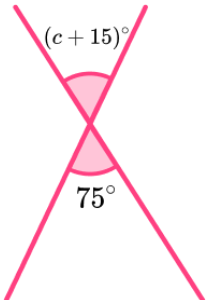
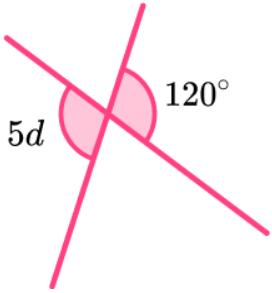
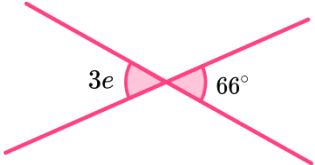
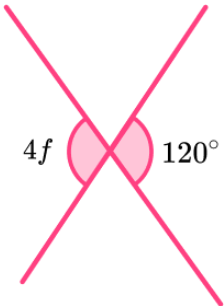
Vertically Opposite Angles - Answers

Group B	Find the missing angles:	
	1) 	1) $b = 133^\circ$, $d = 47^\circ$
	2) 	2) $b = 128^\circ$, $d = 52^\circ$
	3) 	3) $a = 100^\circ$, $b = 80^\circ$
	4) 	4) $a = 60^\circ$, $b = 120^\circ$
	5) 	5) $b = 70^\circ$, $c = 110^\circ$
	6) 	6) $b = 76^\circ$, $c = 104^\circ$

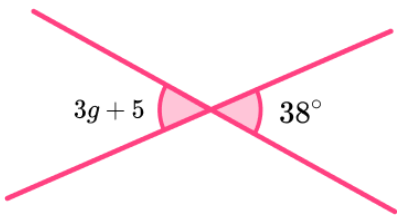
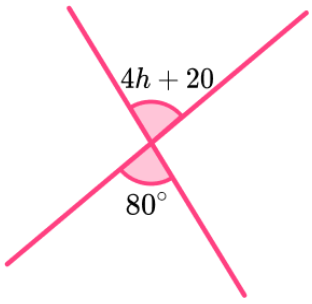
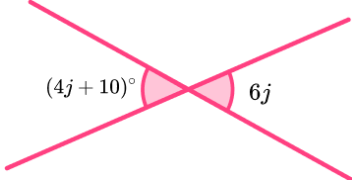
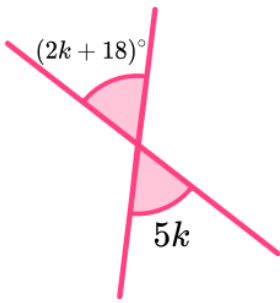
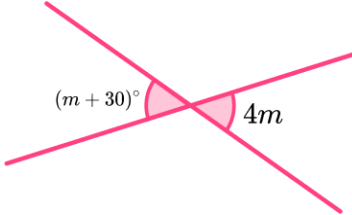
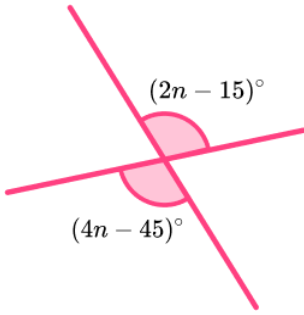
Vertically Opposite Angles - Answers

Group B contd	7)  8)  9)  10)  11)  12) 	7) $b = 108^\circ$, $d = 72^\circ$ 8) $a = 102^\circ$, $b = 78^\circ$ 9) $b = 72^\circ$, $c = 108^\circ$ 10) $b = 114^\circ$, $d = 66^\circ$ 11) $a = 96^\circ$, $b = 84^\circ$ 12) $b = 82^\circ$, $c = 98^\circ$
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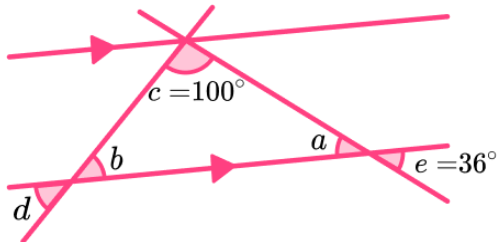
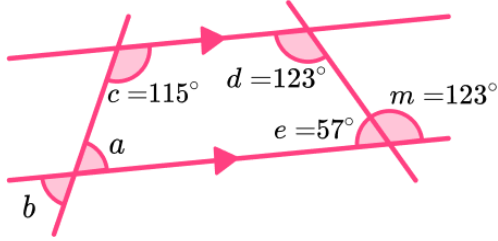
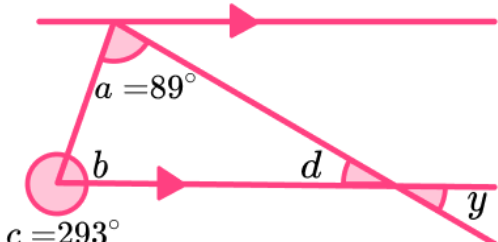
Vertically Opposite Angles - Answers

Group C	Find the unknown variable in each question:	
	1) 	1) $a = 20$
	2) 	2) $b = 60$
	3) 	3) $c = 60$
	4) 	4) $d = 24$
	5) 	5) $e = 22$
	6) 	6) $f = 30$

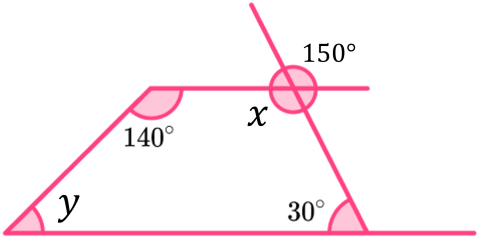
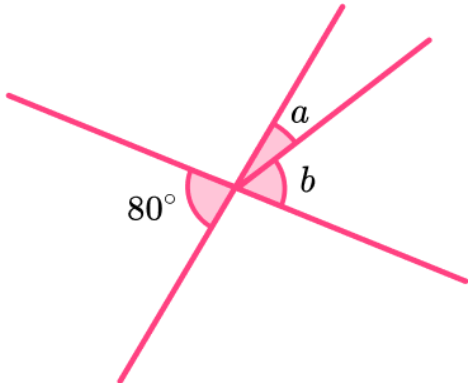
Vertically Opposite Angles - Answers

Group C contd	7)  8)  9)  10)  11)  12) 	7) $g = 11$ 8) $h = 15$ 9) $j = 5$ 10) $k = 6$ 11) $m = 10$ 12) $n = 15$
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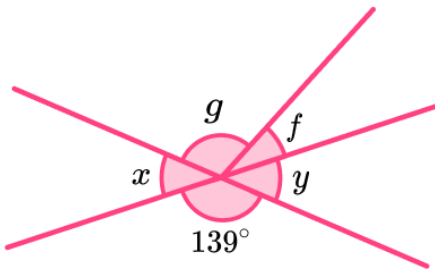
Vertically Opposite Angles - Answers

	Question	Answer
	Applied Questions	
1)	Find the missing angles.  Give reasons for your answers.	$a = 36^\circ$ Vertically opposite angles are equal $b = 44^\circ$ Angles in a triangle add to 180° $d = 44^\circ$ Vertically opposite angles are equal
2)	Find the missing angles.  Give reasons for your answers.	$a = 65^\circ$ Angles in a quadrilateral add to 360° $b = 65^\circ$ Vertically opposite angles are equal.
3)	Find the missing angles.  Give reasons for your answers.	$b = 67^\circ$ Angles around a point add to 360° . $d = 24^\circ$ Angles in a triangle add to 180° . $y = 24^\circ$ Vertically opposite angles are equal.

Vertically Opposite Angles - Mark Scheme

	Question	Answer	
	Exam Questions		
1) (a)	Use information in the diagram below to find the value of x. Give a reason for your answer. 	(a) $x = 150^\circ$ Vertically opposite angles are equal.	(1) (1)
(b)	Determine the value of y. State any angle facts used.	(b) $360 - 140 - 30 - 150$ 40° Angles in a quadrilateral add to 360°	(1) (1) (1)
2)	Angle b is three times the size of angle a.  Work out the size of angle a and angle b.	$4a = 80$ $a = 20^\circ$ $b = 20 \times 3 = 60^\circ$ Alternative Method $80 \div (1 + 3)$ $a = 20^\circ$ $b = 20 \times 3 = 60^\circ$	(1) (1) (1) (1) (1) (1)

Vertically Opposite Angles - Mark Scheme

3)	Angle f is one quarter of the size of angle g. Bob thinks angle f is 28°.  Is Bob correct? Give reasons.	$g = 28 \times 4 = 112$ $f + g = 28 + 112 = 140$ However $f + g = 139^\circ$	(1) (1) (1)
	Vertically opposite angles are equal No, Bob is not correct Alternative Method $4f(= g) + f = 5f$ $5f = 139$ Vertically opposite angles are equal $f = 27.8^\circ$ No, Bob is not correct	(1) (1) (1) (1) (1)	

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