4.9 Angles in Parallel Lines: Test Pack

Calculators not allowed · about 55 minutes

Name: _____ Date: ____ / ____ / _____

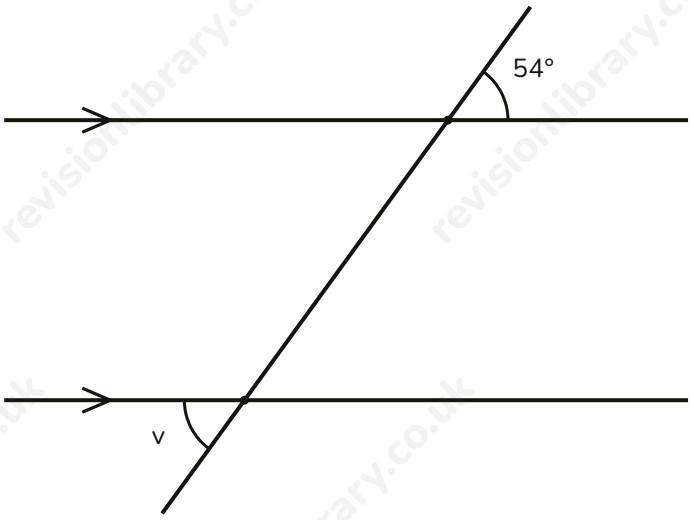
Answer ALL questions. Show all your working.

1 Two parallel lines are cut by a transversal. State whether alternate interior angles are equal, add to 180 degrees, or are complementary.

(1)

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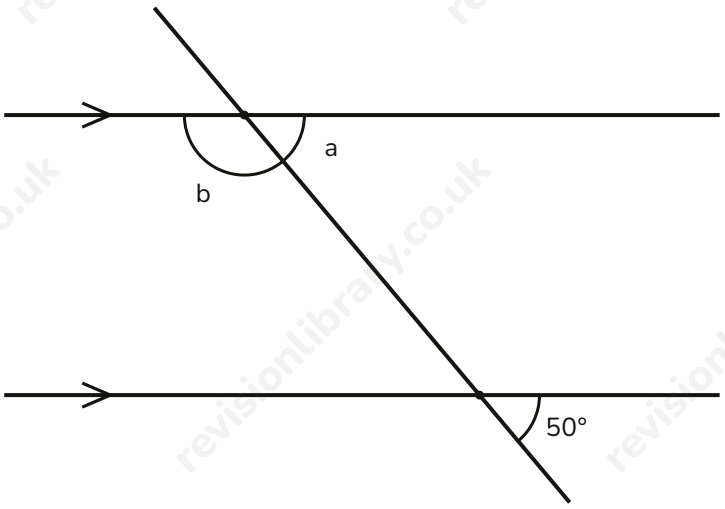
2 Two parallel lines are cut by a transversal. One angle is labelled 54 degrees. A different angle at the lower intersection is labelled v and is alternate exterior to the 54 degree angle. Find v and state the property used.



(3)

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3 Stretch: Two parallel lines are cut by a transversal. At the top intersection the angles a and b are next to each other on a straight line. At the bottom intersection the angle corresponding to a is 50 degrees. Find a and b, showing your steps.



(4)

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4 Two straight lines cross. Two opposite angles are $4y°$ and $(y + 36)°$. Work out the value of y and the size of each of these angles.

(3)

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5 The angles of a triangle are x°, 2x° and 3x°. Work out the value of x and the size of the largest angle.

(4)

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6 Two parallel lines are crossed by a third straight line. One angle is 43°. The angle marked x is between the parallel lines on the same side of the transversal (a C or U shape). Work out the size of x, and give a reason for your answer.

(3)

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7 Two straight lines cross. One of the angles formed is 28°. Write down the size of the angle opposite it and give a reason.

(2)

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8 Three angles meet on a straight line. Two of them are 27° and 77°. Work out the third angle.

(2)

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9 Two parallel lines are crossed by a third straight line. One angle is 112°. The angle marked x is between the parallel lines on the same side of the transversal (a C or U shape).
Work out the size of x, and give a reason for your answer.

(3)

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10 Two straight lines cross. Two opposite angles are 3y° and (y + 10)°. Work out the value of y and the size of each of these angles.

(3)

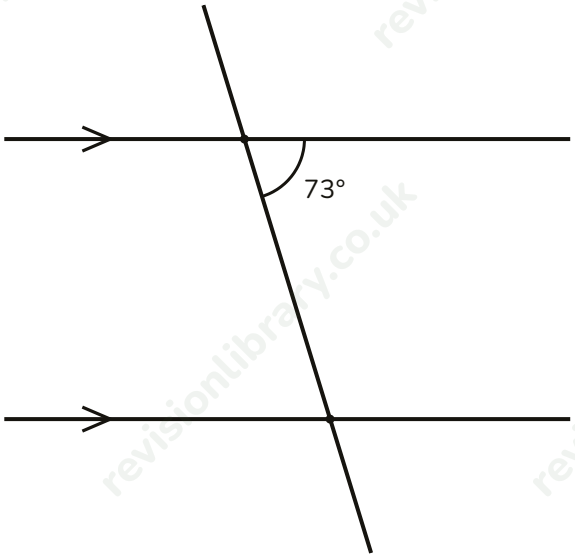
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11 Two parallel lines are crossed by a third straight line. One angle is 49°. The angle marked x is between the parallel lines on the same side of the transversal (a C or U shape).
Work out the size of x, and give a reason for your answer.

(3)

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12 Two parallel lines are cut by a transversal. One interior angle is 73 degrees. Find the four angles at that intersection and state briefly why each equals or supplements 73 where appropriate.



(2)

13 Two parallel lines are cut by a transversal. At the top intersection the angles are a and b, where a and b lie on a straight line together and b = 2a. The angle c at the bottom intersection is co-interior with a. Find a, b and c.

(3)

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14 A ramp is built so that its sloped surface is parallel to a horizontal guide rail. A support strut crosses both, acting as a transversal. The strut makes an angle of (4x - 15) degrees with the ramp surface and an angle of (2x + 25) degrees with the guide rail, measured as alternate angles. Find x.

(3)

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15 Two parallel lines are cut by a transversal. One interior angle is 76 degrees. Find the co-interior (allied) angle on the same side of the transversal.

(2)

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16 Two parallel lines are cut by a transversal. One angle at an intersection is 39 degrees. State the sizes of the other three angles at that same intersection.

(2)

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Mark scheme · 4.9 Angles in Parallel Lines: Test Pack

Question 1

alternate interior angles are equal, oe	B1

Answer: **They are equal**

Question 2

identify alternate exterior angles are equal	M1
state v = 54 or show equality	M1
v = 54 degrees and property: alternate exterior angles equal, cao	A1

Answer: **v = 54 degrees**

Question 3

use correspondence to state a = 50 or relate bottom corresponding angle to a	M1
use angles on a straight line: a + b = 180	M1
calculate b = 180 - 50 = 130	M1
state final: a = 50 degrees, b = 130 degrees with reasoning cao	A1

Answer: **a = 50 degrees, b = 130 degrees**

Question 4

4y = y + 36	M1
y = 12	A1
each angle is 48°	A1

Answer: **y = 12, angles are 48°**

Question 5

6x = 180	M1
x = 30	A1
substitutes to find the largest angle	M1
90° cao	A1

Answer: **x = 30, largest angle 90°**

Question 6

correct angle fact identified	M1
137° cao	A1
co-interior angles add up to 180 degrees	B1

Answer: **137° (co-interior angles add up to 180 degrees)**

Question 7

28°	B1
vertically opposite angles are equal	B1

Answer: **28° (vertically opposite angles are equal)**

Question 8

180 - 27 - 77 or 180 - 104	M1
76° cao	A1

Answer: **76°**

Question 9

correct angle fact identified	M1
68° cao	A1
co-interior angles add up to 180 degrees	B1

Answer: **68° (co-interior angles add up to 180 degrees)**

Question 10

3y = y + 10	M1
y = 5	A1
each angle is 15°	A1

Answer: **y = 5, angles are 15°**

Question 11

correct angle fact identified	M1
131° cao	A1
co-interior angles add up to 180 degrees	B1

Answer: **131° (co-interior angles add up to 180 degrees)**

Question 12

two correct angles found showing use of opposite or supplementary angles	M1
all four: 73, 107, 73, 107 degrees with brief reason such as vertically opposite or supplementary cao	A1

Answer: **73, 107, 73, 107**

Question 13

forms a + 2a = 180	M1
a = 60 degrees, b = 120 degrees cao	A1
c = 120 degrees (co-interior with a) cao	A1

Answer: **a = 60, b = 120, c = 120 degrees**

Question 14

uses alternate angles are equal: 4x - 15 = 2x + 25	M1
simplifies to 2x = 40	M1
x = 20 cao	A1

Answer: **20**

Question 15

uses co-interior angles sum to 180	M1
104 degrees cao	A1

Answer: **104 degrees**

Question 16

uses angles on a straight line sum to 180 to find 141 degrees	M1
the other three angles are 141, 39 and 141 degrees cao	A1

Answer: **141 degrees, 39 degrees, 141 degrees**

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