4.10 Angles in Parallel Lines: 30-minute Pack

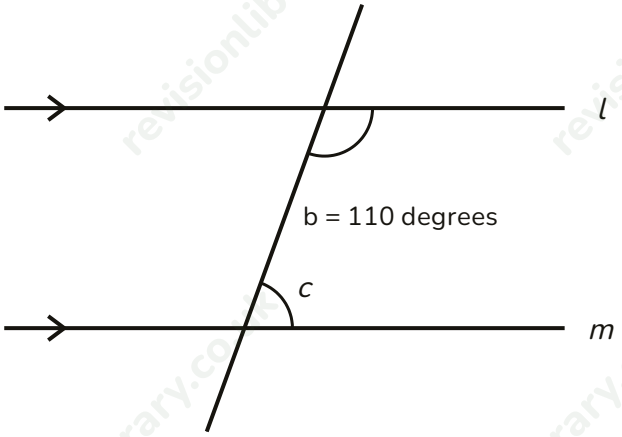
EDEXCEL 1MA1 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Lines l and m are parallel. A transversal cuts them. An angle labelled b on line l is 110 degrees and is interior on the same side of the transversal as angle c on line m. Work out angle c.



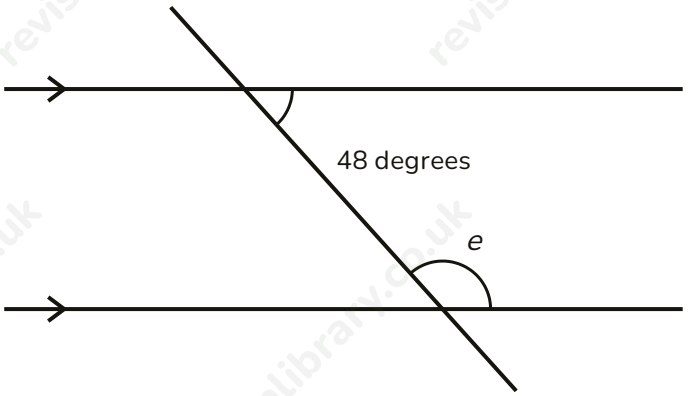
(a) Work out the size of angle c. Give a brief reason. **(3)**

.....

(Total for Question 1 is 3 marks)

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2 Two parallel lines are cut by a transversal. At the upper intersection one acute angle is 48 degrees. Find the obtuse angle e at the lower intersection which is co-interior with the 48 degree angle.



(a) Work out the size of angle e. Give a short reason. **(4)**

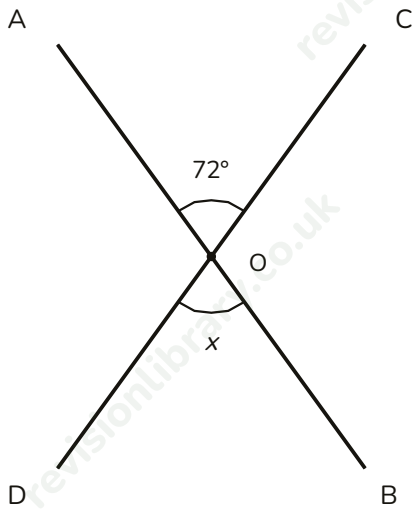
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(Total for Question 2 is 4 marks)

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3 Two straight lines AB and CD cross at point O. Work out the size of angle x.

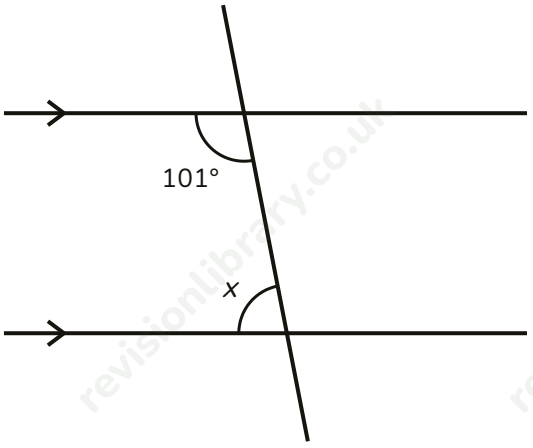
Diagram NOT accurately drawn



(Total for Question 3 is 1 mark)

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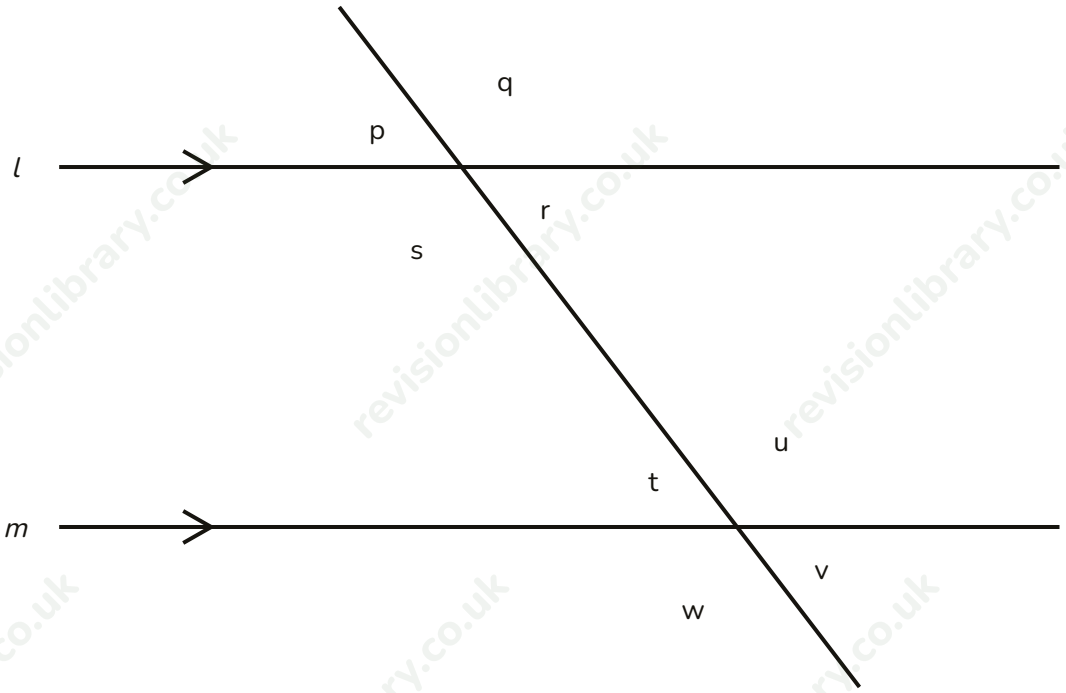
4 The diagram shows a C-shape (co-interior angles) formed between two parallel lines. One marked angle is 101 degrees. Write down the size of the other marked angle, x.



(Total for Question 4 is 1 mark)

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5 The diagram shows two parallel lines cut by a transversal. At the intersection with line l, the four angles formed are labelled p, q, r, s (clockwise from top-left). At the intersection with line m, the four angles formed are labelled t, u, v, w (clockwise from top-left, in the same orientation). Identify which pair of angles are alternate angles.



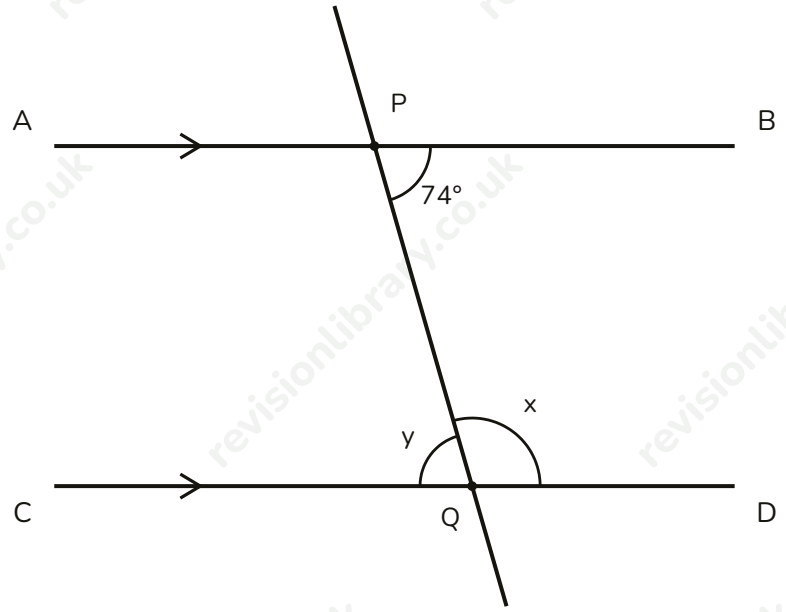
- ☐ A) r and v
- ☐ B) s and t
- ☐ C) r and t
- ☐ D) p and r

(Total for Question 5 is 1 mark)

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6 A car park has two straight rows of parking bays marked by parallel lines AB and CD. A diagonal walkway crosses AB at P and CD at Q. The angle between the walkway and AB, on the interior right of P, is 74 degrees.

Diagram NOT accurately drawn



(a) Work out the size of angle x. Give a reason for your answer. **(2)**

.....

(b) Work out the size of angle y. **(1)**

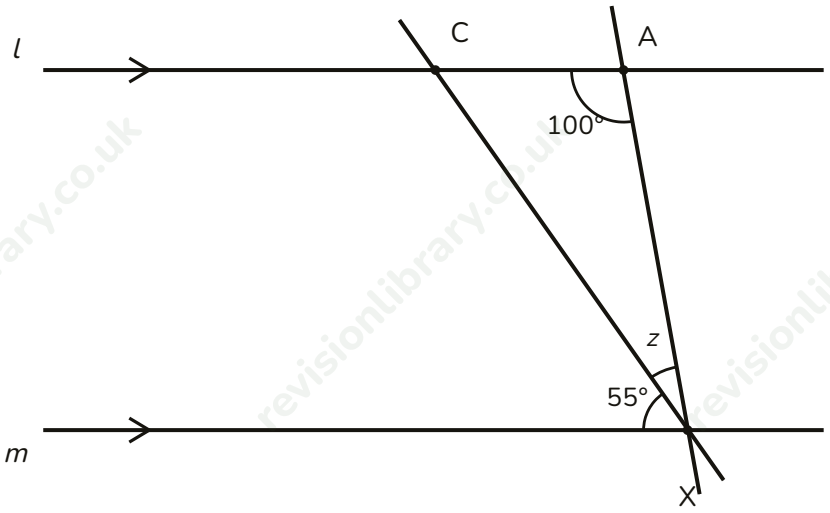
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(Total for Question 6 is 3 marks)

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7 Lines l and m are parallel. A transversal crosses l at A, making an angle of 100 degrees with l, and meets m at point X. A second transversal crosses l at C and also meets m at X, making an angle of 55 degrees with m on the other side of X. Work out the size of angle z.

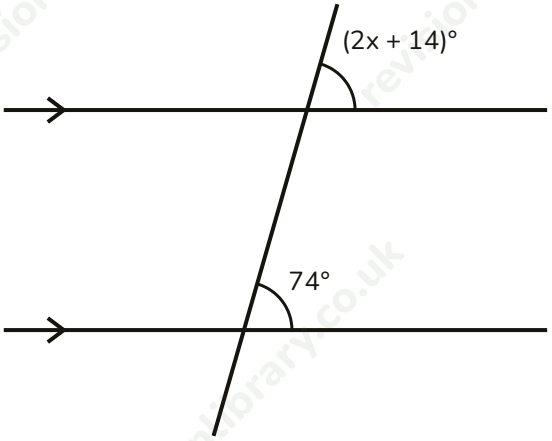
Diagram NOT accurately drawn



(Total for Question 7 is 3 marks)

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8 The diagram shows two parallel lines crossed by a transversal. Two corresponding angles are marked (2x + 14) degrees and 74 degrees.



(a) Find the value of x. **(2)**

.....

(b) Hence work out the size of the co-interior angle to the 74 degree angle. **(1)**

.....

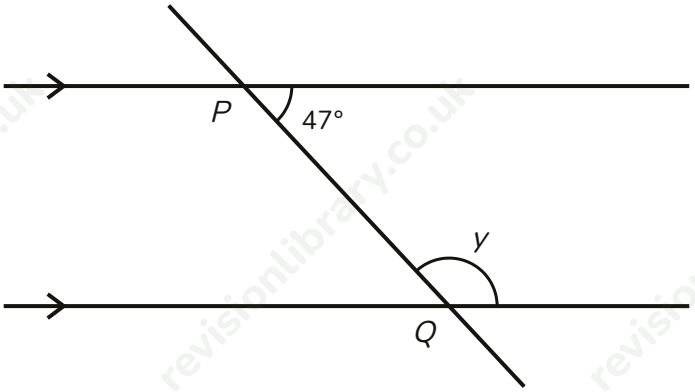
(Total for Question 8 is 3 marks)

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9 Two parallel lines are cut by a single transversal. At point P, where the transversal crosses the top line, the angle between the transversal and the top line is 47 degrees. At point Q, where the transversal crosses the bottom line, y degrees is the co-interior (allied) angle to the 47 degree angle, on the same side of the transversal.

Explain why y = 133 degrees, using properties of parallel lines cut by a transversal.

Diagram NOT accurately drawn



(Total for Question 9 is 4 marks)

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Mark scheme · 4.10 Angles in Parallel Lines: 30-minute Pack

Question 1

(a) identify that co-interior angles sum to 180 degrees (supplementary) or state relation **M1**

(a) 70 degrees cao **A1**

(a) reason: co-interior angles sum to 180 degrees oe **B1**

(a) Answer: 70 degrees

Question 2

(a) identify co-interior angles sum to 180 degrees or state relation **M1**

(a) compute 180 - 48 = 132 **M1**

(a) 132 degrees cao **A1**

(a) reason: co-interior angles on the same side of the transversal sum to 180 degrees oe **B1**

(a) Answer: 132 degrees

Question 3

x = 72 (vertically opposite angles are equal) **B1**

Answer: x = 72 degrees

Question 4

x = 79 cao **B1**

Answer: x = 79 degrees

Question 5

C selected **B1**

Answer: C) r and t

Question 6

(a) 180 - 74 oe **M1**

(a) x = 106 cao, with reason: co-interior angles sum to 180 degrees **A1**

(a) Answer: x = 106 degrees

(b) y = 74 ft (angles on a straight line with x, or alternate angle to the 74 degree angle) **B1**

(b) Answer: y = 74 degrees

Question 7

alternate angle at X (to the 100 degree angle at A) = 100 **M1**

180 - 100 - 55 (angles on a straight line at X, along m) **M1**

z = 25 cao **A1**

Answer: z = 25 degrees

Question 8

(a) 2x + 14 = 74 oe (using corresponding angles are equal) **M1**

(a) x = 30 cao **A1**

(a) Answer: x = 30

(b) 180 - 74 = 106 ft from the 74 degree angle **B1**

(b) Answer: 106 degrees

Question 9

identify that the angles at P and Q are co-interior (allied) angles, lying between the parallel lines on the same side of the transversal **M1**

state that co-interior (allied) angles between parallel lines sum to 180 degrees **A1**

form the equation y + 47 = 180 **M1**

y = 133 degrees cao **A1**

Answer: 133 degrees; because the angle at P and y are co-interior (allied) angles between the parallel lines, so they sum to 180 degrees: y = 180 - 47 = 133

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