



4.5F Inequalities: Foundation Tier Practice

EDEXCEL Edexcel 1MA1 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** Write down the inequality that shows x is less than 7.

(Total for Question 1 is 1 mark)

- 2** On a number line, a point is shaded at 5 and an arrow continues to the right showing all numbers greater than 5. Write an inequality that matches this shading.

(Total for Question 2 is 1 mark)

- 3** Solve the inequality $3x < 12$. Give your answer as an inequality.

(Total for Question 3 is 2 marks)

- 4** Solve the inequality $x + 6 \geq 9$. Give your answer as an inequality.

(Total for Question 4 is 2 marks)

- 5** Solve the inequality $2x - 1 \leq 7$. Give your answer in simplest form.

(Total for Question 5 is 2 marks)

- 6** Solve the inequality $-x < 5$. Give your answer as an inequality and explain any change of direction of the inequality sign.

(Total for Question 6 is 3 marks)

- 7** Work out the integer values of n that satisfy $n < 3$ and $n \geq -1$. List all integers that satisfy both inequalities.

(Total for Question 7 is 3 marks)

- 8** A shop sells a small bag of sweets for p pounds. The price must be at most 2.50 pounds. Write an inequality for p , then state whether $p = 2.50$ is allowed.

(a) Write an inequality that describes the allowed prices p . (2)

(b) Is $p = 2.50$ allowed? State yes or no and give a brief reason. (2)

(Total for Question 8 is 4 marks)

- 9** Solve the inequality $4 + 2x \geq 10$. Show your steps and give the final inequality.

(Total for Question 9 is 4 marks)

10 Solve the inequality $5 - 3x < 2$. Give your answer as an inequality and justify any sign change.

(Total for Question 10 is 5 marks)

11 Solve the compound inequality $1 \leq 2x + 1 < 7$. Show working and give the final range for x .

(Total for Question 11 is 5 marks)

12 A playground has a rule: children may play only if their height h in metres satisfies $1.2 < h \leq 1.6$.

a) Which of these children are allowed to play? Alice is 1.2 m, Jamal is 1.45 m, Priya is 1.6 m, Yusuf is 1.61 m. (2 marks)

b) Write the inequality that shows the allowed heights. (2 marks)

c) Find the smallest possible whole number of centimetres greater than 1.2 m that a child's height could be to be allowed to play. (4 marks)

(a) Which of these children are allowed to play? Alice 1.2 m, Jamal 1.45 m, Priya 1.6 m, Yusuf 1.61 m. (2)

(b) Write the inequality for allowed heights h . (2)

(c) Find the smallest whole number of centimetres greater than 1.2 m that is allowed. (4)
Give your answer in centimetres.

(Total for Question 12 is 8 marks)

Mark scheme · 4.5F Inequalities: Foundation Tier Practice

Question 1

- **B1** $x < 7$ cao
- **Answer:** $x < 7$

Question 2

- **B1** $x \geq 5$ or $x \geq 5$ cao (closed dot at 5)
- **Answer:** $x \geq 5$

Question 3

- **M1** divide both sides by 3 or show equivalent method $3x/3 < 12/3$
- **A1** $x < 4$ cao
- **Answer:** $x < 4$

Question 4

- **M1** subtract 6 from both sides or show method $x \geq 9 - 6$
- **A1** $x \geq 3$ cao
- **Answer:** $x \geq 3$

Question 5

- **M1** add 1 then divide by 2 shown, e.g. $2x \leq 8$ then $x \leq 4$
- **A1** $x \leq 4$ cao
- **Answer:** $x \leq 4$

Question 6

- **M1** multiply or divide by -1 to get $x > -5$, or show rearrangement $-x < 5 \rightarrow x > -5$
- **A1** $x > -5$ cao
- **B1** states reason: inequality direction changes when multiplying/dividing by a negative number oe
- **Answer:** $x > -5$; the inequality reverses because we divide by -1

Question 7

- **M1** identify integer range -1, 0, 1, 2 or show method
- **A1** list: -1, 0, 1, 2 cao
- **B1** states correctly that 3 is not included (ft) or shows $x < 3$ not $x \leq 3$
- **Answer:** -1, 0, 1, 2

Question 8

- (a) **M1** set up $p \leq 2.50$ or $p \leq 2.5$
- (a) **A1** $p \leq 2.5$ cao
- (a) **Answer:** $p \leq 2.5$
- (b) **B1** Yes, because $p \leq 2.5$ allows $p = 2.5$
- (b) **B1** reason stated or equivalent explanation
- (b) **Answer:** Yes. Because $p \leq 2.5$ includes $p = 2.5$.

Question 9

- **M1** subtract 4 from both sides to get $2x \geq 6$
- **M1** divide both sides by 2 to get $x \geq 3$
- **A1** $x \geq 3$ cao
- **B1** correct check or statement that $x = 3$ satisfies $4 + 2x \geq 10$
- **Answer:** $x \geq 3$

Question 10

- **M1** subtract 5 from both sides to get $-3x < -3$
- **M1** divide both sides by -3 and reverse inequality to get $x > 1$
- **A1** $x > 1$ cao
- **B1** states reason: dividing by a negative number reverses the inequality
- **B1** example check: $x = 2$ satisfies $5 - 3x < 2$ (gives $-1 < 2$) or equivalent
- **Answer: $x > 1$**

Question 11

- **M1** subtract 1 across: $0 \leq 2x < 6$
- **M1** divide by 2 across: $0 \leq x < 3$
- **A1** $0 \leq x < 3$ cao
- **B1** states integer examples or checks, e.g. $x = 0$ and $x = 2$ satisfy the inequality
- **B1** notes that $x = 3$ is not allowed (shows strict inequality at upper end)
- **Answer: $0 \leq x < 3$**

Question 12

- (a) **B1** Jamal and Priya identified as allowed
- (a) **B1** Alice and Yusuf identified as not allowed (Alice is exactly 1.2, Yusuf > 1.6)
- **(a) Answer: Jamal and Priya are allowed; Alice and Yusuf are not.**
- (b) **M1** use correct inequality with strict lower bound and inclusive upper bound
- (b) **A1** $1.2 < h \leq 1.6$ cao
- **(b) Answer: $1.2 < h \leq 1.6$**
- (c) **M1** convert 1.2 m to 120 cm and consider strictly greater, so next whole cm is 121 cm
- (c) **M1** check $121 \text{ cm} = 1.21 \text{ m} \leq 1.6 \text{ m}$
- (c) **A1** 121 cm cao
- (c) **B1** explicit statement smallest whole number of cm is 121
- **(c) Answer: 121 cm**