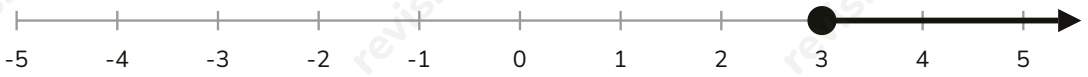
# 2.18 Inequalities and Number Lines: Test Pack

Calculators not allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

**Answer ALL questions. Show all your working.**

**1** Write down the inequality shown on the number line. A filled dot at 3 and an arrow to the right.




**(2)**

**2** Solve the inequality $3(x + 2) < 3x + 6$ and state what this tells you about the solution set.

**(2)**

**3** A shop only allows customers aged at least 16 but under 65 for a day pass. Represent this rule as an inequality and give two ages that are not allowed.

**(2)**


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**4** Find all integer values of x that satisfy $-2 \leq x < 4$. List them.

**(2)**

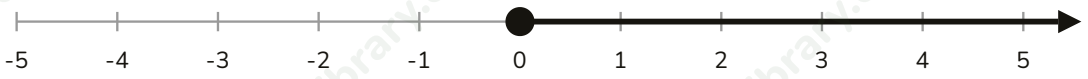
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**5** A number line has a solid circle at -6 and a solid circle at 1, with the line between the circles shaded.
Write down the inequality shown.

**(2)**

---

**6** On the number line, a filled dot at 0 and arrow to the right. Write the inequality and give three example values that satisfy it.




**(2)**

---

**7** (a) Solve $2x + 6 < 14$.
(b) x is an integer greater than or equal to -1. Write down all the values of x that satisfy the inequality.

**(3)**


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**8** Solve $n + 1 > 9$

**(1)**

---

**9** Draw on a number line the inequality $x > 2$. Use an open circle at the boundary and an arrow to show direction.

**(2)**

---

**10** Solve $2y + 2 < 4$

**(2)**

---

**11** (a) Solve $2x + 7 < 17$.
(b) x is an integer greater than or equal to -3. Write down all the values of x that satisfy the inequality.

**(3)**

---

**12** The integer x is greater than -5 and at most 3. Write this as an inequality.

**(2)**


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**13** (a) Solve $2x + 4 < 16$.
(b) x is an integer greater than or equal to -2. Write down all the values of x that satisfy the inequality.

**(3)**

---

**14** Solve $n + 5 < 13$

**(1)**

---

**15** Solve $6 - 2x \leq 8$

**(3)**

---

**16** Solve and represent on a number line: $2x - 7 > 1$. Give the final answer and a short description of the number line representation.

**(3)**

---

**17** Find all integer values of x that satisfy $-3 \leq x < 2$. List them.

**(2)**


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**18** A theme park ride requires riders to be at least 120 cm tall but under 200 cm tall. Using h for height in cm, write this rule as an inequality, then state whether a rider of height 118 cm is allowed on the ride.

**(3)**

---

**19** Stretch. Find all integer values of x that satisfy $-5 < 3x - 2 \leq 10$.

**(4)**

---

**20** State whether $x = 4$ satisfies the inequality $x > 3$.

**(1)**


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# Mark scheme · 2.18 Inequalities and Number Lines: Test Pack

## Question 1

| | |
|---|---|
| identifies ≥ relation and correct variable form such as $x \geq 3$ | M1 |
| $x \geq 3$ cao | A1 |

Answer: **$x \geq 3$**

## Question 2

| | |
|---|---|
| expand both sides or simplify: $3x + 6 < 3x + 6$ leading to $6 < 6$ or $0 < 0$ | M1 |
| contradiction so no solution; answer: no values of x satisfy the inequality cao | A1 |

Answer: **No solution**

## Question 3

| | |
|---|---|
| writes inequality $16 \leq$ age $< 65$ or equivalent | M1 |
| gives two correct disallowed ages such as 15 and 65 cao | A1 |

Answer: **16 ≤ age < 65; not allowed: 15 and 65**

## Question 4

| | |
|---|---|
| lists integers from -2 up to 3 inclusive | M1 |
| -2, -1, 0, 1, 2, 3 cao | A1 |

Answer: **-2, -1, 0, 1, 2, 3**

## Question 5

| | |
|---|---|
| $-6 \leq x$ | B1 |
| $x \leq 1$ | B1 |

Answer: **$-6 \leq x \leq 1$**

## Question 6

| | |
|---|---|
| states inequality $x \geq 0$ or similar | M1 |
| gives three correct examples (eg 0, 1, 5) cao | A1 |

Answer: **$x \geq 0$; examples: 0, 1, 5**

## Question 7

| | |
|---|---|
| correct first step | M1 |
| (a) $x < 4$ | A1 |
| (b) -1, 0, 1, 2, 3 | B1 |

Answer: **(a) $x < 4$, (b) -1, 0, 1, 2, 3**

## Question 8

| | |
|---|---|
| $n > 8$ cao | B1 |

Answer: **$n > 8$**

## Question 9

| | |
|---|---|
| open circle at 2 placed | M1 |
| arrow to the right from the open circle or shading to the right shown | A1 |

Answer: **Open circle at 2 with arrow to the right**

## Question 10

| | |
|---|---|
| correct first step with an inequality sign kept or an equation solved | M1 |
| $y < 1$ cao | A1 |

Answer: **$y < 1$**

## Question 11

| | |
|---|---|
| correct first step | M1 |
| (a) $x < 5$ | A1 |
| (b) -3, -2, -1, 0, 1, 2, 3, 4 | B1 |

Answer: **(a) $x < 5$, (b) -3, -2, -1, 0, 1, 2, 3, 4**

## Question 12

| | |
|---|---|
| $-5 < x$ | B1 |
| $x \leq 3$ | B1 |

Answer: **$-5 < x \leq 3$**

## Question 13

| | |
|---|---|
| correct first step | M1 |
| (a) $x < 6$ | A1 |
| (b) -2, -1, 0, 1, 2, 3, 4, 5 | B1 |

Answer: **(a) $x < 6$, (b) -2, -1, 0, 1, 2, 3, 4, 5**

## Question 14

| | |
|---|---|
| $n < 8$ cao | B1 |

Answer: **$n < 8$**

## Question 15

| | |
|---|---|
| correct first step | M1 |
| divides by the negative number | M1 |
| $x \geq -1$ cao (inequality sign reversed) | A1 |

Answer: **$x \geq -1$**

## Question 16

| | |
|---|---|
| adds 7 to both sides and divides by 2: $2x > 8$ then $x > 4$ | M1 |
| identifies open circle at 4 on number line | M1 |
| $x > 4$; number line: open circle at 4 with arrow to the right cao | A1 |

Answer: **$x > 4$**

## Question 17

| | |
|---|---|
| identifies the correct range of integers, including -3 but excluding 2 | M1 |
| -3, -2, -1, 0, 1 cao | A1 |

Answer: **-3, -2, -1, 0, 1**

## Question 18

| | |
|---|---|
| correct inequality: $120 \leq h < 200$ | B1 |
| compares 118 to the lower bound 120 correctly | M1 |
| not allowed, because $118 < 120$ | A1 |

Answer: **$120 \leq h < 200$; a rider of 118 cm is not allowed**

## Question 19

| | |
|---|---|
| adds 2 to all three parts, e.g. $-3 < 3x \leq 12$ | M1 |
| divides all three parts by 3 correctly | M1 |
| $-1 < x \leq 4$ cao | A1 |
| 0, 1, 2, 3, 4 cao | A1 |

Answer: **$-1 < x \leq 4$; the integers are 0, 1, 2, 3, 4**


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## Question 20

Yes, because 4 > 3 **B1**

Answer: **Yes**


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