Test 7

There are **7 questions** in this test. Give yourself **10 minutes** to answer them all.
You may use a calculator for this test.

1. Circle the solution to the equation $5x = 2$.

$x = -1$ $\quad$ $x = \frac{2}{5}$ $\quad$ $x = 3$ $\quad$ $x = \frac{5}{2}$

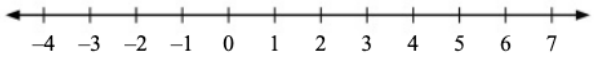
[1]

2. Which of these is the nth term rule for the sequence 3, 5, 7, 9, ...? Circle your answer.

$2n$ $\quad$ $2n + 3$ $\quad$ $3n + 2$ $\quad$ $2n + 1$

[1]

3. Show the inequality $-1 < x \leq 6$ on the number line below.



[1]

4. Make x the subject of this formula: $z = xy + 2$.

5. Show that $4ij(j - 2) - 2(j + 1)$ can be written as $-2(1 + 4ij) - 2j(1 - 2ij)$.

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[2]

6. Factorise the expression $y^2 - 49$.

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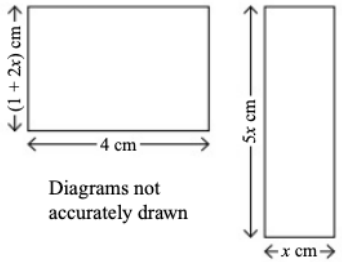
[2]

7. The two rectangles on the right have the same perimeter.
Find the value of x.

Give your answer as a mixed number in its simplest form.



Diagrams not accurately drawn

$x =$ .....

[3]

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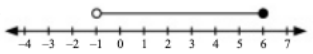
1. $x = \frac{2}{5}$ ***[1 mark]***

2. Difference in terms is 2, so the rule will contain $2n$. $2 \times 1 = 2$ but the first term is 3, so you need to add 1. So the rule is $2n + 1$ ***[1 mark]***.

3. 

[1 mark]

4. $z = xy + 2$, so $z - 2 = xy$ ***[1 mark]***,
so $\frac{z-2}{y} = x$ ***[1 mark]***

5. $4ij(j - 2) - 2(j + 1)$
$= 4ij^2 - 8ij - 2j - 2$ ***[1 mark]***
$= -2 - 8ij - 2j + 4ij^2$
$= -2(1 + 4ij) - 2j(1 - 2ij)$ ***[1 mark]***

6. $y^2 - 49 = y^2 - 7^2$
$= (y + 7)(y - 7)$
[2 marks for the correct factorisation, otherwise 1 mark for attempting to use the difference of two squares]

7. Perimeter of first rectangle
$= 2 \times (1 + 2x) + 2 \times 4$
$= (2 + 4x) + 8 = 10 + 4x$
Perimeter of second rectangle
$= 2 \times 5x + 2 \times x = 10x + 2x = 12x$
[1 mark for either perimeter correct]
The perimeters are equal so:
$10 + 4x = 12x$ ***[1 mark]***
$\Rightarrow 10 = 8x \Rightarrow x = \frac{10}{8} = 1\frac{1}{4}$ ***[1 mark]***