Section 3: The modulus function

Exercise level 2

1. (i) Sketch the graph of $y = \left|\frac{1}{2}x - 1\right|$.

   (ii) Solve $3 = \left|\frac{1}{2}x - 1\right|$.

   (iii) Express the solution to $\left|\frac{1}{2}x - 1\right| \leq 3$ in the form $\left|x + a\right| \leq b$

2. (i) Sketch the graph of $y = \left|4\sin x\right|, \quad 0 \leq x \leq 2\pi$

   (ii) How many solutions are there to the equation $0.4 = \left|4\sin x\right|$ in $[0, 2\pi]$?

3. Solve $\left|3x - 2\right| > 1$

4. (i) Sketch a graph of $y = \left|6x - 2\right|$

   (ii) On the same axes, sketch $y = \left|x - 5\right|$

   (iii) Hence, or otherwise, solve $\left|6x - 2\right| < \left|x - 5\right|$

   (iv) Express your solution in the form $\left|ax + b\right| < c$