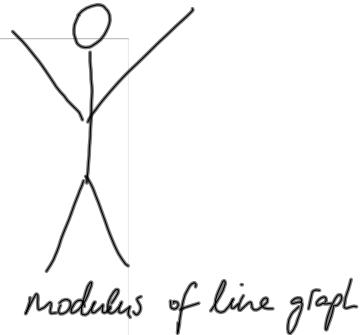
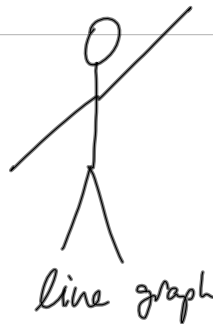


chapter **7** Algebra 3

## Section 7.3 Modulus



PROJECT MATHS  
**Text & Tests 6**

231

## 1. Modular equations

**Example 1**

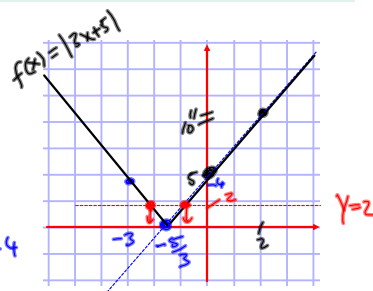
Sketch the graph of  $f(x) = |3x + 5|$  and hence solve the equation  $|3x + 5| = 2$

(i) geometrically and (ii) algebraically.

$$g(x) = 3x + 5 \quad \begin{matrix} (0, 5) \\ (2, 11) \end{matrix}$$

$$\begin{aligned} 3x + 5 &= 0 \\ x &= -\frac{5}{3} = -2\frac{2}{3} \end{aligned}$$

$$f(-3) = |3(-3) + 5| = |-9 + 5| = 4$$



$$\begin{aligned} \text{when } |3x + 5| = 2 &\Rightarrow (3x + 5)^2 = 4 \\ 9x^2 + 30x + 25 &= 4 \\ 9x^2 + 30x + 21 &= 0 \\ 3x^2 + 10x + 7 &= 0 \\ (3x + 7)(x + 1) &= 0 \end{aligned}$$

$$\begin{aligned} 3x + 7 = 0 & \quad | \quad x = -1 \\ x = -\frac{7}{3} & \quad | \quad \text{(see graph)} \end{aligned} \quad \checkmark$$