

MODULUS FUNCTION

1. Find the values of the following.

(a) $|-12|$ [Ans: 12]

(b) $|4 - 11| + |7 - 19|$ [Ans: 19]

(c) $-|22 - 55| + |9 - 3|$ [Ans: -27]

2. Solve the following equations.

(a) $|2x - 5| = 25$ [Ans: $x = 15$ or $x = -10$]

(b) $|x^2 + 3x - 34| = 6$ [Ans: $x = -8, -7, 5$ or 4]

(c) $|3x - 2| - 2x = 0$ [Ans: $x = 2$ or $x = \frac{2}{5}$]

(d) $|15x^2 - 20| = -13x$ [Ans: $x = -\frac{5}{3}$ or $-\frac{4}{5}$]

(e) $|2x - 5| = |x|$ [Ans: $x = \frac{5}{3}$ or $x = 5$]

(f) $|3x + 7| = |9x - 2|$ [Ans: $x = -\frac{5}{12}$ or $x = \frac{3}{2}$]

3. Solve the simultaneous equations

$$\begin{aligned} 2y + x &= 5, \\ y &= |2 - x|. \end{aligned}$$

[Ans: $x = -1$ and $y = 3$, or $x = 3$ and $y = 1$]

4. Sketch the following graph and state the corresponding range of values of y .

(a) $y = \left| \frac{1}{2}x - \frac{9}{4} \right|$ for $-2 < x \leq 5$ [Ans: $0 \leq y < \frac{13}{4}$]

(b) $y = |x^2 - 5x + 6|$ for $1 \leq x < 4$ [Ans: $0 \leq y \leq 2$]

(c) $y = |x^2 + x - 2|$ for $-2 \leq x \leq 2$ [Ans: $0 \leq y \leq 4$]

(d) $y = |4x + 2| - 3$ for $-3 \leq x < 3$ [Ans: $-3 \leq y < 11$]