Solutions

Accept equivalent correct methods and supported interpretations. The marks check reasoning; they are not an official grade.

2.1 A – Squaring gives x=3 or -2; only 3 makes both original sides nonnegative and equal. B fails substitution because $\sqrt{4}$=2, not -2; C retains that extraneous candidate.

Correct response linked to the given case.

2.2 A – Absolute value cannot be negative. B and C both assume a negative absolute value can occur; the nonnegative range excludes every candidate.

Correct response linked to the given case.

2.3 -1 – The second factor is zero at -1.

Correct response linked to the given case.

2.4 False – Multiplicity does not create distinct ordered pairs.

Correct response linked to the given case.

3.1 Require $x \geq 0$. Squaring yields $x^2 - 2x - 3 = (x-3)(x+1) = 0$. Candidates are 3 and -1. The original gives $\sqrt{9} = 3$ at 3, but $\sqrt{1} = 1 \neq -1$ at -1. Only $x = 3$ works.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence . Accurate conditions, checks or qualification.

3.2 Equate outputs to get $x+2 = x^2 - 2x + 1$, or $x^2 - 3x - 1 = 0$. Thus $x = (3 \pm \sqrt{13})/2$ and $y = (7 \pm \sqrt{13})/2$ with matching signs. The discriminant 13 is positive, so there are two distinct real intersections; both expressions for y agree by the derived equation.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence. Accurate conditions, checks or qualification.

3.3 The absolute value gives $3x + 2 = 7$ or -7, hence $x = 5/3$ or -3. The rational equation requires $x \neq 3$ and simplifies to $x + 3 = 6$, whose sole candidate 3 is excluded. It has no solution.

Sound conclusion or proposed method. Relevant supporting steps or textual evidence. Accurate conditions, checks or qualification.