Answers

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Quadratic functions and expressions **Short activity**

All, some or none?

For each question there are 5 related statements. In each case decide which of them are true.

1. The quadratic $y = x^2 - 2x - 3$:
   a. rearranges to $y = (x-1)^2 - 2$ ✗ — $y = (x-1)^2 - 4$
   b. Has a y intercept at -3 ✓
   c. factorises to $y = (x-3)(x+1)$ ✓
   d. has an axis of symmetry at $x = 1$ ✓
   e. has a minimum value of -3 ✗ — minimum at $(1, -4)$

2. The quadratic $y = (x+1)^2 + 2$: — $y = x^2 + 2x + 3$
   a. rearranges to $y = (x+1)(x+2)$ ✓
   b. has a minimum value of 2 ✓
   c. always has positive values for y ✓ → $b^2 - 4ac = 2^2 - 4 \times 1 \times 3 = 4 - 12 = -8$
   d. has an axis of symmetry ✓ AT $x = -1$
   e. doesn't cross the x axis ✓

3. All quadratics:
   a. have an axis of symmetry ✓
   b. cross the x axis ✗
   c. can be arranged to a completed square format ✓
   d. cross the y axis once ✓
   e. have a minimum value ✗ → they could have a maximum

Challenge: For any statements that are false in question 3, give counter examples and explain when and why they are false.