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 $y = (x - 1)^2 - 2$ d. has an axis of symmetry at $x = 1$
    b. Has a y intercept at -3   e. has a minimum value of -3
    c. factorises to $y = (x-3)(x+1)$

2. The quadratic $y = (x+1)^2 + 2$:
    a. rearranges to $y = (x+1)(x+2)$ d. has an axis of symmetry
    b. has a minimum value of 2   e. doesn't cross the x axis
    c. always has positive values for y

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

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

www.furthermaths.org.uk

Managed by

MEI
Innovators in
Mathematics
Education

Quadratic functions and expressions   **Short activity**

<u>**Teacher notes**</u>

Content:

- Manipulating different forms of quadratic functions and relating them to the graphical representation

Possible uses:

- As an extension task for able pupils
- As a consolidation task

Resource options:

- PowerPoint file for whole class projection
- Worksheet for individual pupils

<u>**Answers**</u>

1. 3 are true (b c d)
2. 4 are true (b c d e)
3. 3 are true (a c d)

Challenge question:

b) positive quadratics, with a minimum value>0 do not cross the x axis; negative quadratics with a maximum value <0 do not cross the x axis

e) negative quadratics do not have a minimum value (but do have a maximum value instead).