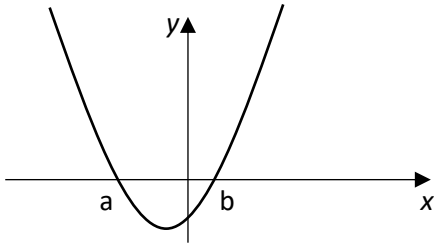
National 5 Homework

Algebraic Skills | Sketching Quadratic Functions

1a. Sketch the graph of the function $f(x) = x^2 - 6x - 7$.

1b. Annotate your graph to show the coordinates of the turning point, the roots and the y-intercept.

2a. The graph of the function $f(x) = x^2 + 4x - 12$ is shown below. State the values of a and b.



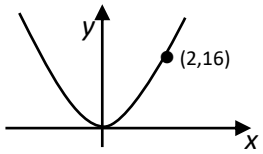
2b. Find the coordinates of the turning point and the y-intercept.

2c. State the equation of the axis of symmetry.

3a. Sketch the graph with equation $y = (x - 4)^2 + 6$, stating clearly the coordinates of the turning point and the y-intercept.

3b. State the equation of the axis of symmetry.

4. The graph below has equation $y = ax^2$. State the value of a.



5. Sketch the graph of $y = (x - 3)^2 + 1$.

On your sketch, show clearly the coordinates of the turning point and the point of intersection with the y-axis.

[SQA Paper 1 ; 3 Marks]

6. Match each statement below with one of these quadratic functions.

$f(x) = 3x^2$; $f(x) = x^2 + 4x + 3$; $f(x) = (x - 5)^2 - 3$; $f(x) = 9 - x^2$; $f(x) = (x + 5)^2 + 2$

i) Has a maximum turning point
ii) Passes through (-2,12)
iii) Equation of axis of symmetry is x = 5
iv) Has 2 negative roots.

v) Sketch and annotate the graph of the function **not** associated with any of the above statements.

7a. A graph has equation $f(x) = (x + a)^2 + b$. The equation of its axis of symmetry is x = 3. State the value of a.

7b. The graph also passes through (5,10). Work out the value of b.