

National 5 Final Exam Practice

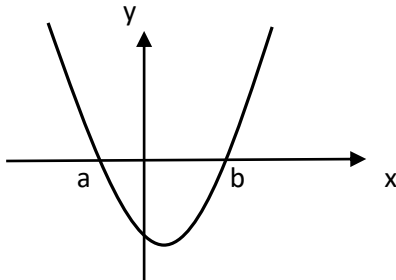
Algebraic Skills

Solving Quadratic Equations & Roots

Average Allocation

3 / 4 Marks

1. Solve $x^2 - 6x + 8 = 0$.
2. Find the roots of the quadratic equation $x^2 - x - 30 = 0$.
3. Solve $x^2 - 16 = 0$.
- 4a. Rearrange the equation $x^2 - x = 3x - 4$ into the form $ax^2 + bx + c = 0$.
- 4b. Hence solve $x^2 - x = 3x - 4$.
5. Solve $x^2 - 5x - 3 = 0$ correct to 1 decimal place.
6. Find the roots of the quadratic equation $2x^2 + x - 15 = 0$
7. Rearrange then solve $a^2 = 12 - 4a$.
8. Solve $x^2 - 3x - 2 = 0$ correct to 1 decimal place.
9. Solve $3x^2 - 10x + 8 = 0$
10. Find the values of a and b in the diagram below which shows the graph of $y = x^2 - 3x - 10$.



11. A rectangle has a length of $(x + 5)$ cm and a breadth of $(x + 1)$ cm. The area of the rectangle is 32cm^2 .
 - a. Show that $x^2 + 6x - 27 = 0$.
 - b. Hence find the value of x and the dimensions of the rectangle.
12. Determine the number of roots of the equation $y = 2x^2 + 3x + 4$.
13. Solve $3x^2 + 3x - 1 = 0$ correct to 1 decimal place.
14. Two functions have equations $f(x) = 2x^2 - x + 3$ and $g(x) = x^2 + 5x - 2$.
 - a. When both functions are equal, show that $x^2 - 6x + 5 = 0$
 - b. Hence find the values of x for which $f(x) = g(x)$.
15. Determine the number of roots of the function $f(x) = 4x^2 - 12x + 3$
16. Find the values of k for which the quadratic equation $y = 2x^2 + 4x + k$ has no roots.
17. State the discriminant condition for a quadratic equation to have two equal roots.