

Activity I

Here are some attempts at solving the quadratic equation $2x^2 + 6x - 7 = 0$

Roots are required correct to 3 decimal places.

Such questions are typically given 3 marks – 2 for method and 1 for accuracy.

Should the following attempts (all abstracted from actual attempts) be given full marks?

If not, then how many?

(The relevant specification reference is *2.7 Solve quadratic equations by using the quadratic formula or completing the square*)

A $\frac{-6 \pm \sqrt{6^2 - 4 \times 2 \times (-7)}}{2 \times 2} = \frac{-6 \pm \sqrt{36 + 56}}{4} = \frac{-6 \pm \sqrt{92}}{4} = \frac{-6 \pm 9.5916}{4} = 0.898 \text{ or } -3.898$

B $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = 0.898 \text{ or } -3.898$

C $\frac{-6 \pm \sqrt{92}}{4} = 0.898 \text{ or } -3.898$

D $\frac{-3 \pm \sqrt{23}}{2} = 0.898 \text{ or } -3.898$

E $2x^2 + 6x - 7 = 0$ so $(2x + 7.796)(x - 0.898) = 0$ so roots are $= 0.898$ or -3.898

F $2(x + 1.5)^2 - 4.5 - 7 = 2(x + 1.5)^2 - 11.5$ so $(x + 1.5)^2 = 5.75$ so $x = \sqrt{5.75} - 1.5 = 0.898$