

SOLVING QUADRATIC EQUATIONS BY COMPLETING THE SQUARE



GRADE 8

Examination Practice Questions

You should have:

A ruler, protractor, compasses, a pen, pencil, eraser, calculator.
For some questions, you may need tracing paper.

Instructions

- Use **black** ink or ball-point pen.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- **Calculators may be used.**

Information

- The marks for each question are shown in brackets.
- Use the number of marks for each question as a guide as to how much time to spend on each question. As a rough guide, you can multiply the number of marks by 1.2 to see how many minutes you should spend on a question.
- Questions been carefully compiled from or modelled on a variety of past papers and will generally get more challenging as the document progresses. Some of the later questions will go beyond the core grade level for this topic.

Advice

- Read each question carefully before you start to answer it.
- Don't forget to have fun.
- Check your answers at the end.

Q1.

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Use the method of completing the square to solve the equation $x^2 - 8x + 1 = 0$.

Give your answer in the form $a \pm \sqrt{b}$.

.....
(4 marks)

Q2.

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Use the method of completing the square to solve the equation $x^2 + 6x + 2 = 0$

Give your answer in the form $a \pm \sqrt{b}$ where a and b are integers.

.....
(4 marks)

Q3.

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Solve $x^2 + 8x + 6 = 0$ by completing the square.

Give your answer in the form $a \pm \sqrt{b}$, where a and b are integers.

.....
(4 marks)

Q4.

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Solve, by completing the square, the equation $x^2 = 22x - 5$.

Leave your answer in surd form.

.....
(4 marks)

Q5.

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Determine the roots of $f(x) = 4x^2 + 8x + 3$.

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(4 marks)

Q6.

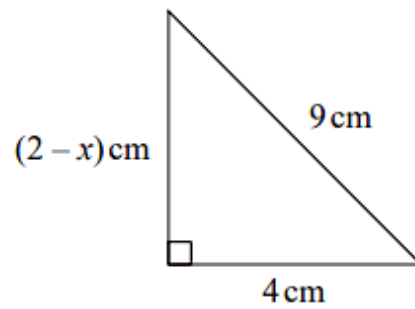
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Solve, by completing the square, the equation $7 - 4x - x^2 = 0$

Give your solutions in the form $e \pm \sqrt{f}$ where e and f are integers.

.....
(4 marks)

The lengths of the sides of a right-angled triangle are 9 cm, 4 cm and $(2 - x)$ cm as shown in the diagram below.



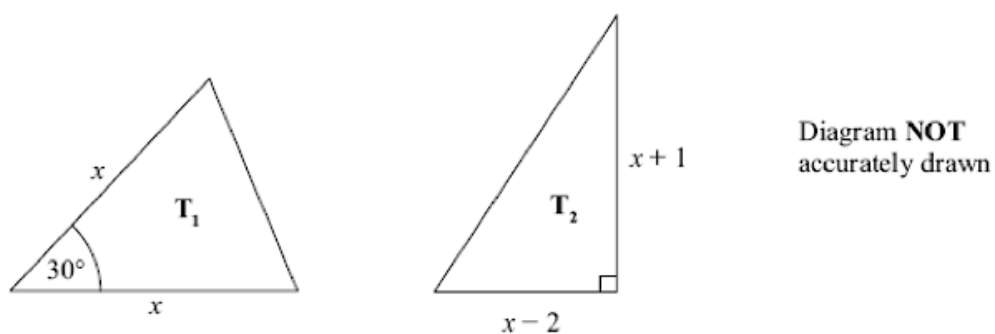
Using the method of **completing the square**, find the value of x , giving your answer in surd form.

Joy is solving a quadratic equation of the form $x^2 + bx + c = 0$ where b and c are integers.

She correctly solves the equation to get $x = 3 \pm \sqrt{13}$

Work out the values of b and c .

Here are two triangles T_1 and T_2 .



The lengths of the sides are in centimetres.

The area of triangle T_1 is equal to the area of triangle T_2 .

Work out the value of x , giving your answer in the form $a + \sqrt{b}$ where a and b are integers.