Turning Points of Graphs

Please write clearly in block capitals

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Materials

For this paper you must have:
- mathematical instruments

You can use a calculator.

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- You may ask for graph paper, tracing paper and more answer paper. These must be tagged securely to this answer book.

Advice

- In all calculations, show clearly how you work out your answer.
1. Define the turning point of a quadratic graph. 

(Level 5) [1 mark]

2. Circle the turning points of the graph below.

(Level 5) [2 marks]
3(a) Circle the turning points on the two quadratic graphs below. 

3(b) Belle looks at graph $A$ and says, “The turning point is always the minimum point of any quadratic graph”. Comment on her statement.
Find the turning point of the following equations by completing the square. (Level 6)

4(a) \[ y = x^2 + 4x + 7 \]

[2 marks]

Answer

4(b) \[ y = 3x^2 + 36x + 99 \]

[3 marks]

Answer

4(c) \[ y = 2x^2 + 7x - 10 \]

[3 marks]

Answer

Turn over for next question
The graph shows a quadratic function with the region between \(-2 \leq x < 1\) missing. (Level 6)

5(a) Find the line of symmetry of the quadratic and use this to plot the rest of the curve. [1 mark]

6(b) What are the coordinates of the turning point of the curve? [1 mark]

Answer

Turn over for next question
Given that:

\[ f(x) = x - 4 \]
\[ g(x) = x^2 \]

6(a) Find the turning point of each curve and comment on them with relation to \( f(x) \).

\[ fg(x): \]

[2 marks]

Answer

6(b) \[ gf(x): \]

[2 marks]

Answer

6(c) Comment on your answers

[1 mark]

End of questions