A299 Quadratic inequalities

Q1.

Solve $2x^2 + 3x - 2 > 0$

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(Total for question = 3 marks)

Q2.

Solve $2x^2 - 5x - 12 > 0$

.....

(Total for question = 3 marks)

Q3.

Solve $x^2 > 3x + 4$

.....

(Total for question = 3 marks)

Q4.

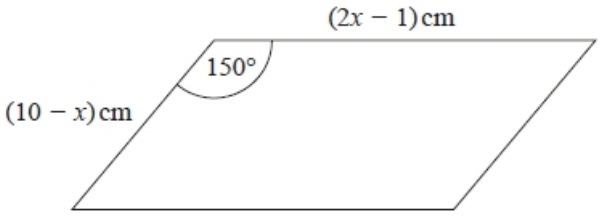
Solve the inequality $x^2 > 3(x + 6)$

.....

(Total for question = 4 marks)

Q5.

The diagram shows a parallelogram.



The area of the parallelogram is greater than 15 cm^2

(a) Show that $2x^2 – 21x + 40 < 0$

(3)

(b) Find the range of possible values of x.

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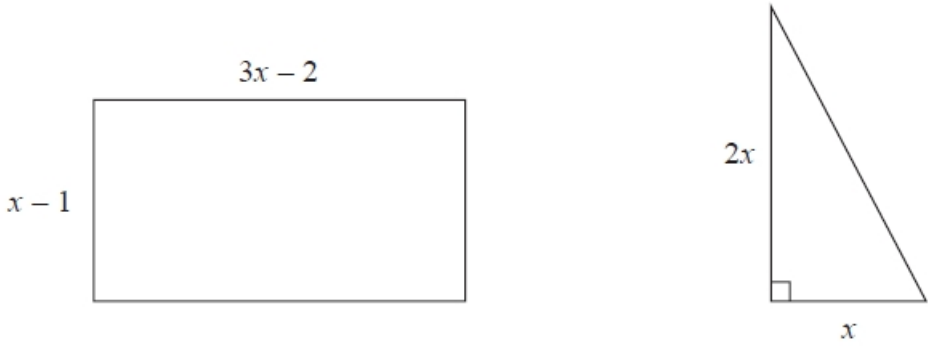
(3)

(Total for question = 6 marks)

Q6.

Here is a rectangle and a right-angled triangle.



All measurements are in centimetres.
The area of the rectangle is greater than the area of the triangle.

Find the set of possible values of *x*.

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(Total for question = 5 marks)

Q7.

(a) Show that $(2x + 1)(x + 3)(3x + 7)$ can be written in the form $ax^3 + bx^2 + cx + d$ where a, b, c and d are integers.

(3)

(b) Solve $(1 - x)^2 < \frac{9}{25}$

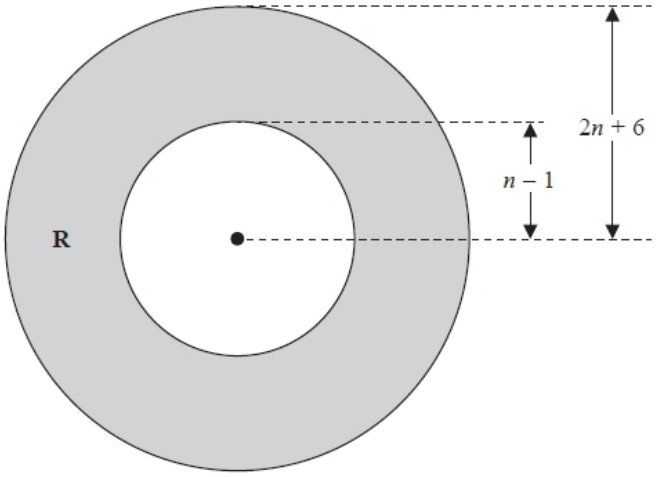
.....

(3)

(Total for question = 6 marks)

Q8.

The region **R**, shown shaded in the diagram, is the region between two circles with the same centre.



The outer circle has radius ($2n + 6$)
The inner circle has radius ($n – 1$)
All measurements are in centimetres.

The area of **R** is greater than the area of a circle of radius ($n + 13$) cm.

n is an integer.

Find the least possible value of n.
You must show all of your working.

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(Total for question = 5 marks)

Q9.

n is an integer such that $3n + 2 \leq 14$ and $\frac{6n}{n^2 + 5} > 1$

Find all the possible values of n.

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(Total for question = 5 marks)