1. **In this question you must show all stages of your working.**
Solutions relying on calculator technology are not acceptable.

Find the set of values of x for which

(a) $4(x - 5) < 2x - 9$

(2)

(b) $x(2x - 5) \leqslant 63$

(3)

(c) $4(x - 5) < 2x - 9$ **and** $x(2x - 5) \leqslant 63$

(1)

(Total for Question 1 is 6 marks)

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2. **In this question you must show all stages of your working.**
Solutions relying on calculator technology are not acceptable.

(i) Using the laws of indices, solve the equation

$$4^{2y+1} = \frac{32^{4y}}{2}$$

(3)

(ii) Solve the equation

$$x\sqrt{27} + 21 = \frac{6x}{\sqrt{3}}$$

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

(4)

(Total for Question 2 is 7 marks)

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3. $$f(x) = \frac{\left(4 + 3\sqrt{x}\right)^2}{x} \qquad x > 0$$

(a) Find $f'(x)$, writing the answer in simplest form.

(5)

(b) Hence find an equation of the tangent to the curve $y = f(x)$ at the point (4, 25).

Write the answer in the form $y = mx + c$, where m and c are constants to be found.

(3)

(Total for Question 3 is 8 marks)
