

- 2 (a) Find the first three terms, in ascending powers of x , in the expansion of $(1 + ax)^6$. [1]

1. Find

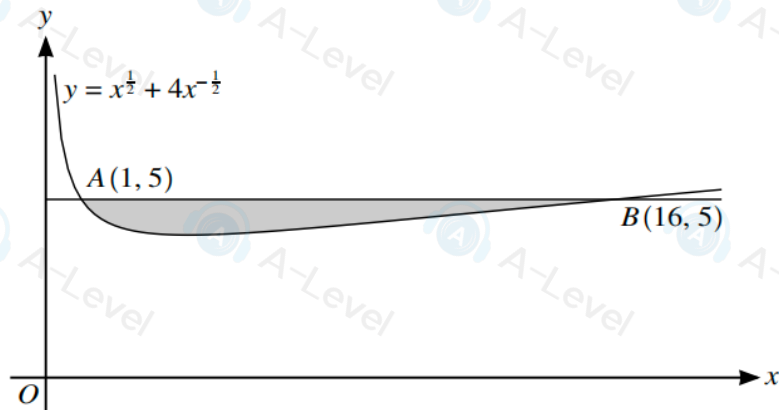
$$\int (2x - 5)(3x + 2)(2x + 5) dx$$

writing your answer in simplest form.

(5)

DO NOT WRITE

8



The diagram shows the curve with equation $y = x^{\frac{1}{2}} + 4x^{-\frac{1}{2}}$. The line $y = 5$ intersects the curve at the points $A(1, 5)$ and $B(16, 5)$.

- (a) Find the equation of the tangent to the curve at the point A . [4]

DO NOT WRITE IN THIS AREA

DO NOT

8.

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

A curve has equation $y = f(x)$, $x > 0$

The point $P(4, 12)$ lies on the curve.

Given that

- $f'(x) = 3\sqrt{x} + kx^2$ where k is a constant
- the equation of the tangent to the curve at P has equation $y = 10x + c$ where c is a constant

(a) (i) show that $k = \frac{1}{4}$

(ii) find the value of c

(4)

(b) Hence find the value of $f''(x)$ at P .

(3)

(c) Find $f(x)$.

(4)