

**Mathematics Department – Langholm Academy**

**HIGHER HOMEWORK**

**UNIT 2**

**CHAPTER 2**

**Integration 2**

**Higher - Unit 2**  
**Integration 2**

1. Find

a.  $\int_0^3 2x \, dx$

b.  $\int_0^3 5 - 4x \, dx$

c.  $\int_0^3 6x^2 \, dx$

2. Find the exact value of

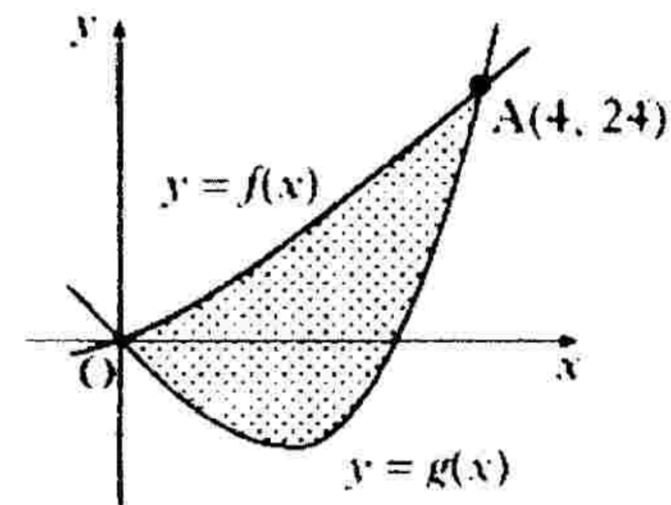
a.  $\int_9^{36} \frac{1}{\sqrt{x}} \, dx$

c.  $\int_1^4 \sqrt{x}(\sqrt{x} + 1) \, dx$

b.  $\int_0^9 \frac{3}{2\sqrt{x}} \, dx$

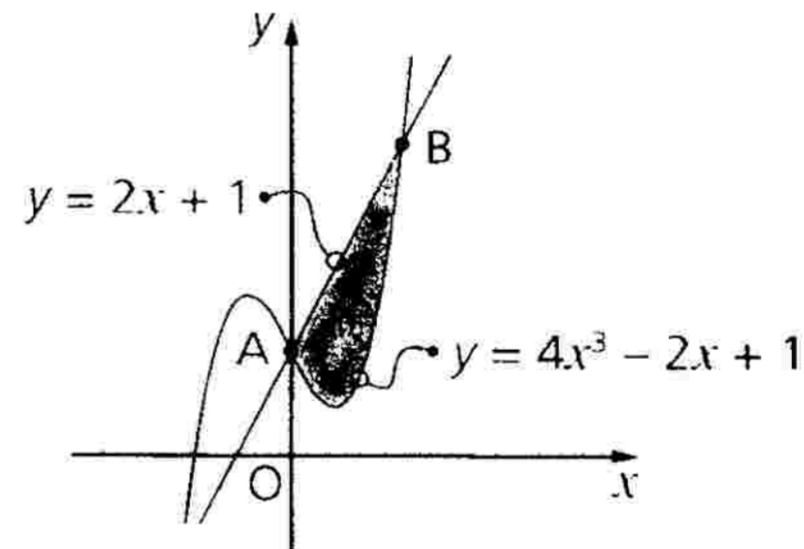
d.  $\int_1^9 \left( \frac{4}{x^3} + \frac{1}{2\sqrt{x}} \right) \, dx$

3. The graphs of  $f(x) = x^2 + 2x$  and  $g(x) = x^3 - x^2 - 6x$  are shown in the diagram. They intersect at the origin and (4,24). Find the shaded area.



4. The diagram shows the graphs of  $y = 2x + 1$  and  $y = 4x^3 - 2x + 1$

- a. Find the coordinates of the points A and B
- b. Calculate the shaded area



5. The parabola in the equation has equation  $y = 32 - 2x^2$ . The shaded area lies between the lines  $y = 24$  and  $y = 14$ . Calculate the shaded area.

