

## A2 Maths Test (omicron) Version O

1) By making  $t$  the subject of one equation and substituting it into the other, eliminate  $t$  from the following pairs of equations to obtain the Cartesian equation in  $x$  and  $y$  in the form  $y = f(x)$ :

$$y = t^2 + 1, x = 3t$$

2) Evaluate  $\int_1^5 -3xe^{x^2} dx$

3)  $f: x \rightarrow e^x + k$ . ( $x \in R$ ) Sketch the graph of  $f(x)$  and state its range.

4)  $x^2 + 2xy + 3y^2 = 6$  Find  $\frac{dy}{dx}$

5) Find  $\int_0^3 \frac{x}{\sqrt{x+1}} dx$  (use the substitution  $t^2 = x + 1$ )

## A2 Maths Test (omicron) Version P

1) By making  $t$  the subject of one equation and substituting it into the other, eliminate  $t$  from the following pairs of equations to obtain the Cartesian equation in  $x$  and  $y$  in the form  $y = f(x)$ :

$$y = t^2 - 1, x = 3t$$

2) Evaluate  $\int_1^4 -2xe^{x^2} dx$

3)  $f: x \rightarrow e^x + k$ . ( $x > 0$ ) Sketch the graph of  $f(x)$  and state its range.

4)  $x^2 + 2xy + 4y^2 = 6$  Find  $\frac{dy}{dx}$

5) Find  $\int_0^2 \frac{x}{\sqrt{x+1}} dx$  (use the substitution  $t^2 = x + 1$ )

## A2 Maths Test (omicron) Version Q

1) By making  $t$  the subject of one equation and substituting it into the other, eliminate  $t$  from the following pairs of equations to obtain the Cartesian equation in  $x$  and  $y$  in the form  $y = f(x)$ :

$$y = 2t^2 + 1, x = t - 1$$

2) Evaluate  $\int_1^2 -9xe^{x^2} dx$

3)  $f: x \rightarrow e^x + k$ . ( $x < 0$ ) Sketch the graph of  $f(x)$  and state its range.

4)  $x^2 + 2xy + 9y^2 = 6$  Find  $\frac{dy}{dx}$

5) Find  $\int_0^2 \frac{2x}{\sqrt{x+1}} dx$  (use the substitution  $t^2 = x + 1$ )

## A2 Maths Test (omicron) Version R

1) By making  $t$  the subject of one equation and substituting it into the other, eliminate  $t$  from the following pairs of equations to obtain the Cartesian equation in  $x$  and  $y$  in the form  $y = f(x)$ :

$$y = at^2 + b, x = ct$$

2) Evaluate  $\int_b^c -axe^{x^2} dx$

3)  $f: x \rightarrow e^x + k$ . ( $x < -1$ ) Sketch the graph of  $f(x)$  and state its range.

4)  $x^2 + 2xy + ay^2 = 6$  Find  $\frac{dy}{dx}$

5) Find  $\int_0^a \frac{x}{\sqrt{x+1}} dx$  (use the substitution  $t^2 = x + 1$ )

### Answers Version O

- 1)  $y = \frac{x^2}{9} + 1$
- 2)  $-\frac{3}{2}e^{25} + \frac{3}{2}e$
- 3)  $f(x) > k$
- 4)  $\frac{dy}{dx} = \frac{-x-y}{x+3y}$
- 5)  $\frac{8}{3}$

### Answers Version P

- 1)  $y = \frac{x^2}{9} - 1$
- 2)  $e - e^{16}$
- 3)  $f(x) > k+1$
- 4)  $\frac{dy}{dx} = \frac{-x-y}{x+4y}$
- 5)  $\frac{4}{3}$

### Answers Version Q

- 1)  $y = 2(x+1)^2 + 1$
- 2)  $-\frac{9}{2}e^4 + \frac{9}{2}e$
- 3)  $k < f(x) < k+1$
- 4)  $\frac{dy}{dx} = \frac{-x-y}{x+9y}$
- 5)  $\frac{8}{3}$

### Answers Version R

- 1)  $y = \frac{ax^2}{c^2} + b$
- 2)  $\frac{1}{2}ae^{b^2} - \frac{1}{2}ae^{c^2}$
- 3)  $k < f(x) < \frac{1}{e} + k$
- 4)  $\frac{dy}{dx} = \frac{-x-y}{x+ay}$
- 5)  $\frac{2}{3}\sqrt{a+1}(a-2) + \frac{4}{3}$