

H

National Qualifications

2022

Mathematics

Paper 1

Friday, 6 May

Formulae List

[Braille page 2] Formulae List

Circle:

The equation $x^2 + y^2 + 2gx + 2fy + c = 0$ represents a circle centre $(-g, -f)$ and

radius $\sqrt{g^2 + f^2 - c}$.

The equation $(x - a)^2 + (y - b)^2 = r^2$ represents a circle centre (a, b) and radius r .

Scalar product:

$\mathbf{a} \cdot \mathbf{b} = |\mathbf{a}| |\mathbf{b}| \cos \theta$ where θ is the angle between **a** and **b**

or

$\mathbf{a} \cdot \mathbf{b} = a_1 b_1 + a_2 b_2 + a_3 b_3$ where **a** = $\begin{pmatrix} a_1 \\ a_2 \\ a_3 \end{pmatrix}$, **b** = $\begin{pmatrix} b_1 \\ b_2 \\ b_3 \end{pmatrix}$

[Braille page 3] Trigonometric formulae:

$$\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$$

$$\cos(A \pm B) = \cos A \cos B \pm \sin A \sin B$$

$$\sin 2A = 2 \sin A \cos A$$

$$\cos 2A = \cos^2 A - \sin^2 A$$

$$= 2 \cos^2 A - 1$$

$$= 1 - 2 \sin^2 A$$

Table of standard derivatives:

$f(x); f'(x)$

$\sin ax; a \cos ax$

$\cos ax; -a \sin ax$

Table of standard integrals:

$f(x); \int f(x) dx$

$\sin ax; (-1/a) \cos ax + c$

$\cos ax; (1/a) \sin ax + c$