

Logarithmic Equations

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 \mathbf{a} and \mathbf{b}

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

Trigonometric formulae:

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

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

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

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

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

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

Table of standard derivatives:

$f(x)$	$f'(x)$
$\sin ax$	$a \cos ax$
$\cos ax$	$-a \sin ax$

Table of standard integrals:

$f(x)$	$\int f(x) dx$
$\sin ax$	$-\frac{1}{a} \cos ax + c$
$\cos ax$	$\frac{1}{a} \sin ax + c$

Essential Skills 18

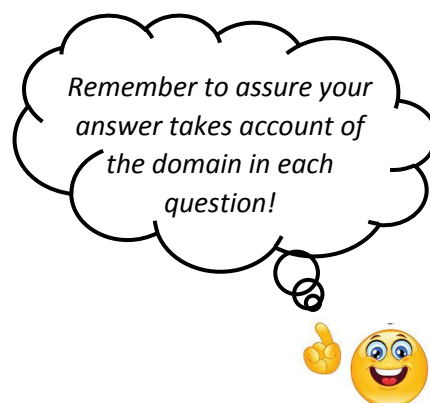
The skills in this series of worksheets appear frequently.

These are the GIFTS you must take to succeed

Logarithmic Equations

Solve for x in each:

1. $\log_a 6 + \log_a x = \log_a 12$
2. $\log_a 4x - \log_a 3 = \log_a 8$
3. $\log_a x + 2 \log_a 4 = \log_a 80$
4. $\frac{1}{2} \log_2 x + \log_2 5 = \log_2 10$
5. $\log_a 81 - 3 \log_a x = \log_a 3$
6. $\log_a(x + 1) + \log_a(x - 1) = \log_a 8$
7. $\log_a 4x + \log_a(x - 1) = \log_a 3$
8. $\log_9(2x + 5) - \log_9(x - 5) = \log_9 \frac{x}{2}$
9. $\log_5(x + 1) + \log_5(x - 3) = 1$
10. $\log_7(x^2 - 1) - \log_7(x - 1) = 2$



APPLYING QUESTIONS

1. Find the x -coordinate of the point where the graph of the curve with equation $y = \log_3(x - 4) + 2$ intersects the x -axis.
2. Solve: $6 \log_x 2 - 2 \log_x 4 = 1$